Appendix 26: 2021 Terrestrial Effects Monitoring and Mitigation Program Annual Report

REPORT

Agnico Eagle Mines Limited - Meliadine Division

2021 Terrestrial Effects Monitoring and Mitigation Program Annual Report

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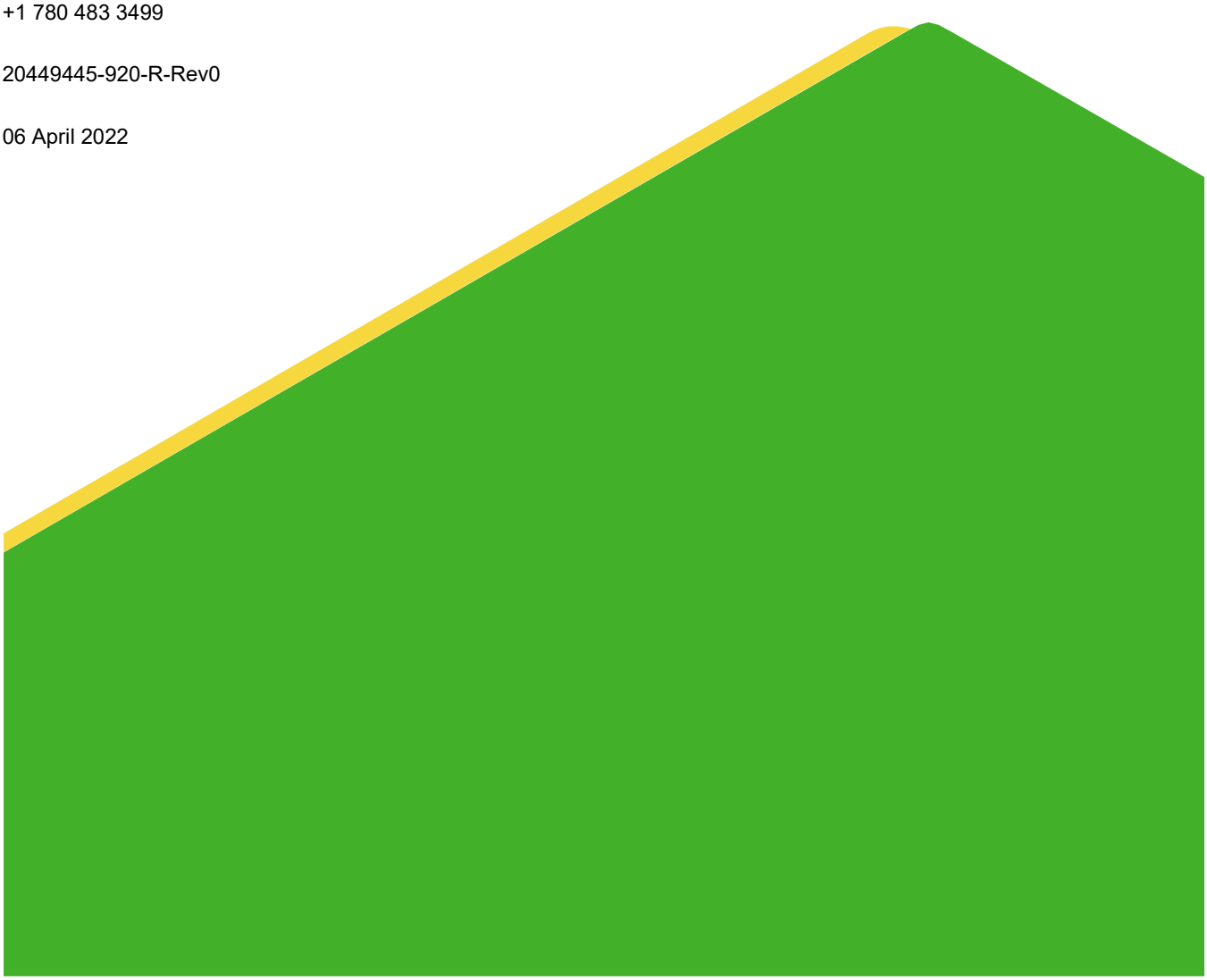

Distribution List

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Study Limitations

On behalf of Agnico Eagle Mines Limited (Agnico Eagle), Nuqsana Golder Engineering and Environmental Inc. (Nuqsana Golder) has prepared this Terrestrial Effects Monitoring and Mitigation Program (TEMMP) Annual Report for the 2021 Monitoring Period at the Meliadine Gold Mine near Rankin Inlet, Nunavut.

This report was prepared, based in part, on information obtained from Agnico Eagle and other external information sources. In preparing the report, Golder has relied in good faith on the information provided. We accept no responsibility for any deficiency or inaccuracy contained in this report because of our reliance on the aforementioned information.

The findings and conclusions documented in this report have been prepared for the specific application to this Project and have been developed in a manner consistent with that level of care normally exercised by environmental professionals currently practicing under similar conditions in the jurisdiction.

With respect to regulatory compliance issues, regulatory statutes are subject to interpretation. These interpretations may change over time and should be reviewed regularly.

If new information is discovered during future work, the conclusions of this report should be re-evaluated, and the report amended, as required, prior to any reliance upon the information presented herein.

Executive Summary

The Agnico Eagle Mines Limited (Agnico Eagle) Meliadine Gold Mine (the Project or the Mine), received a Project Certificate (No. 006) from the Nunavut Impact Review Board (NIRB) in February 2015, and amended in February 2019 (Amendment No. 001) and in March 2022 (Amendment No. 002). A Terrestrial Environment Management and Monitoring Plan (TEMMP) for the Project was prepared for submission with the Project Final Environmental Impact Statement (FEIS; Golder 2014) and forms a component of the documentation series produced in accordance with the Project, updated and submitted to the NIRB in June 2020 (TEMMP Version 3; Agnico Eagle 2020a). This report addresses requirements of the Terms and Conditions of the NIRB Project Certificate (No. 006), as relevant to the TEMMP.

The objectives of the TEMMP Annual Report are to summarize annual data collected from wildlife and vegetation monitoring programs, and to describe natural variation and potential Project-related effects to wildlife populations within and adjacent to the Project. The data was collected according to procedures and sampling or monitoring intervals outlined in the Project's Standard Operating Procedures (SOPs) and the TEMMP. The 2021 TEMMP Annual Report describes monitoring objectives and methods, 2021 survey results, mitigation activities, and management recommendations (i.e., adaptive management). The following summary documents monitoring information collected for the 2021 TEMMP for the Meliadine Project located in the Kivalliq Region of Nunavut.

Incorporation of Inuit Qaujimajatuqangit

- Six meetings and site visits were held in 2021 where Inuit Qaujimajatuqangit (IQ) was collected. When possible, field programs in 2021 were guided by IQ, including the assistance of local field assistants. As per 2020, participation of local field assistants was limited during 2020 due to COVID-19 health and safety protection measures. Annual contributions from Inuit to the monitoring programs are presented in Section 3.0.

Direct Habitat Loss

- Direct habitat loss is assessed every three years and was assessed in 2021 (next assessment in 2024). The project footprint is currently at 38% (633 ha) of the total approved footprint (1,682 ha).

Indirect Habitat Loss

- Indirect habitat loss for caribou and wildlife habitat (soils and vegetation) is assessed every three years and was not assessed in 2021 (next assessment in 2022, tied to the Vegetation Health Program).

Wildlife Observations

Wildlife Sighting/Track Surveys

- Wildlife sighting/track surveys were completed by Agnico Eagle personnel along the All Weather Access Road (AWAR) and infrastructure throughout the year.
- A total of 3,336 individuals from 16 identified wildlife species and 4 unidentified wildlife species groups (e.g., duck species) were recorded during surveys along the AWAR in 2021.
- A total of 445 individuals from 12 identified wildlife species and 5 unidentified wildlife species groups were recorded during surveys on the Mine site in 2021.

Wildlife Incidentals

- There were 94 recorded incidental observations, representing 280 individuals of 10 species, around the Mine site (including the camp area) and the AWAR in 2021.

Den Sites

- Two Arctic fox (*Vulpes lagopus*) dens were observed in 2021. One den was observed approximately 375 m east of km 29 of the AWAR, and one den was observed 1.3 km west of the Meliadine Mine.

Bird Nests

- Four common raven nests, one sandhill crane nest, and one semipalmated plover nest were observed on Site 2021.

Incidents and Mortalities

- A total of 37 mortalities and 2 wildlife incidents across 4 different species was reported at the Project from 2 February to 15 December 2021; 36 of these mortalities were suspected or confirmed to be caused as a direct result of Project activities. No caribou mortalities were reported in 2021.

Wildlife Deterrents

- Wildlife deterrents (i.e., propane cannons and fake owls) were implemented at six locations to deter birds from nesting on site.

Barren-ground Caribou

Caribou Behaviour Monitoring

- In total, 46 behaviour monitoring sessions were completed in 2021. Analysis of data found caribou farther from infrastructure (>300 m) displayed lower proportions of response behaviours, however the relatively small sample size was noted.
- The proportion of response behaviours (i.e., alert or running behaviours) in groups increased following disturbances, but behaviours usually returned to baseline levels after six minutes.

Caribou Remote Camera Study

- As in 2020, a study was conducted in 2021 using motion-trigger cameras to study caribou interactions with the Project infrastructure during their annual migration, and particularly the AWAR.
- The cameras were successful at capturing crossing timing locations consistent with locations identified in 2020 and with locations identified by IQ from Inuit Elders and community members.
- Physical attributes of the road did not appear to influence crossing locations. All recorded caribou crossings occurred between 5 minutes and 8.75 hours of a vehicle passing, with an average of 1.3 hours.

Caribou Advisory

- The Qamanirjuaq herd caribou migration through the Project area was monitored from 22 June through 25 July 2021.
- The AWAR was closed for 122.5 hours across 10 days. Vehicle traffic on site was restricted for 194.75 hours across 12 days.
- Open pit operations were shutdown for 211 hours across 12 days.
- The Exploration Camp was shutdown for 215.5 hours across 14 days.
- Activities at the Main Camp were restricted for 209.5 hours across 14 days.

Hunter Harvest

- 40 hunters participated to the 2021 Hunter Harvest Study; participants were interviewed in person three times during the year by the harvest study coordinator (June 2021, October 2021 and January 2022 to collect the remaining 2021 data).
- 30 participants reported harvesting caribou (*Rangiger tarandus*).
- Fourteen (14) muskox (*Ovibos moschatus*), two (2) wolverine (*Gulo gulo*), and 18 wolves (*Canis lupus*) were harvested in 2021. Other harvested terrestrial mammals included Arctic fox and Arctic hare (*Lepus arcticus*). In the marine environment, ringed seal (*Pusa hispida*; 25 individuals) was the most common species harvested followed by beluga (*Delphinapterus leucas*; 11), bearded seal (*Erignathus barbatus*; 2) and walrus (*Odobenus rosmarus*; 3).
- A considerable number of bird species were harvested by Rankin Inlet participants in 2021 with Canada goose (*Branta canadensis*; 134 individuals) and snow goose (*Anser caerulescens*; 126) harvested at the highest levels. Gulls (*Larus* sp.), ptarmigan (*Lagopus* sp.), sandhill crane (*Grus canadensis*), and northern pintail (*Anas acuta*) were also harvested.
- Arctic char (*Salvelinus alpinus*; 628 fish) and lake trout (*Salvelinus namaycush*; 216 fish) were the most common species caught by fisherman. Relatively small numbers of Arctic cod (*Arctogadus glacialis*), Arctic grayling (*Thymallus arcticus*), lake whitefish (*Coregonus clupeaformis*), and burbot (*Lota lota*) were caught.

Birds

Shoreline Surveys

- A total of 45 nests of 11 species were detected in 2021. Shoreline surveys in 2021 were spread over a longer number of days, in the middle of the season compared to other years.

Point Counts

- Species richness and diversity were similar among habitats and among years.
- Species density decreased with survey date. Distance from the AWAR and habitat did not appear to have strong influence on overall bird density.

PRISM

- Agnico Eagle contributed to the Environment and Climate Change Canada (ECCC) PRISM surveys in 2018 and 2019 and will continue to do so every five years (next survey in 2023/2024).

Raptors

- The 2021 Arctic Raptors Research Program was not completed in 2021 due to COVID-19 restrictions.

Soil and Vegetation Monitoring

- Soil and vegetation health monitoring (dust and metals survey) is assessed every three years and was not assessed in 2021 (next assessment in 2022, tied to the Indirect Habitat Loss assessment).

Non-native Plants

- Two occurrences of dandelion were found along the AWAR. Occurrences were hand-pulled, placed in plastic bags, and incinerated.

Environmental Variables

- The maximum annual temperature of 27.4°C was recorded on 15 July 2021 and the minimum annual temperature -39.8°C was recorded on 27 February 2021; the mean annual temperature was -8.3°C. Total recorded annual precipitation was 366.2 mm and snowmelt began 29 May 2021 when the average daily air temperature exceeded 0°C. Environmental variables will continue to be monitored on an on-going basis.

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Appendix G
Hunter Harvest Study

Acronyms

Acronym	Full Term
AIC	Akaike's Information Criterion
ATV	All Terrain Vehicle
AWAR	All-weather Access Road
CESCC	Canadian Endangered Species Conservation Council
COVID-19	Coronavirus Disease
ECCC	Environment and Climate Change Canada
ELC	Ecological Landscape Classification
FEIS	Final Environmental Impact Statement
GIS	Geographic Information System
GLM	Generalized Linear Model
GN	Government of Nunavut
GN DoE	Government of Nunavut Department of Environment
GNWT ENR	Government of Northwest Territories Department of Environment and Natural Resources
GPS	Global Positioning System
HHS	Hunter Harvest Study
IOL	Inuit Owned Lands
IQ	Inuit Qaujimajatuqangit
KHTO	Kangiqliniq Hunters and Trappers Organization
KivIA	Kivalliq Inuit Association
LSA	Local Study Area
MOU	Memorandum of Understanding
NIRB	Nunavut Impact Review Board
NRV	Natural Range of Variability
NWMB	Nunavut Wildlife Management Board
PRISM	Program for Regional and International Shorebird Monitoring
RSA	Regional Study Area
SARA	Species At Risk Act
SLRA	Screening Level Risk Assessment
SOP	Standard Operating Procedures
TBD	To Be Determined
TEMMP	Terrestrial Environment Management and Monitoring Plan
TEMMP Report	Terrestrial Effects Monitoring and Mitigation Program Report
TSF	Tailings Storage Facility
VEC	Valued Ecosystem Component

1.0 INTRODUCTION

1.1 Background

The Agnico Eagle Mines Limited (Agnico Eagle) Meliadine Gold Mine (the Project), located in the Kivalliq Region of Nunavut (Figure 1), received a Project Certificate (No. 006) from the Nunavut Impact Review Board (NIRB) in February 2015 (with Amendment 001 in February 2019 and Amendment 002 in March 2022). The subsequent Water Licence and leases allowed for the construction of a gold mine and ancillary facilities including an All-weather Access Road (AWAR), barge unloading facilities, lay-down area, and a fuel tank farm in Rankin Inlet. A conceptual Terrestrial Environment Management and Monitoring Plan (TEMMP) for the Mine was prepared for submission with the Project Final Environmental Impact Statement (FEIS; Golder 2014). The TEMMP will be reviewed and updated on an as-needed basis as the Mine proceeds from detailed design and construction through operations, closure, and post-closure. The TEMMP was updated in June 2020 and issued to the NIRB (TEMMP Version 3; Agnico Eagle 2020a).

This report addresses requirements of Project Certificate No. 006, which were first included in the 2017 Annual TEMMP Report (Golder 2018) and are listed in Table 1 of this report. The 2021 TEMMP Annual Report (this document) is the fourth of a series of annual TEMMP summary reports for the Mine and captures the second year of operations for the Mine. The purpose of this report is to summarize the 2021 data collected from wildlife and vegetation monitoring programs, and to describe natural variation and potential Project-related changes in wildlife populations within and adjacent to the Mine. The 2021 Annual Report describes monitoring objectives and methods, annual results, mitigation activities, and management recommendations (i.e., adaptive management). The Mine is anticipated to be operational through to 2027, with closure and post-closure activities continuing until 2037.

1.2 Project Description

The Project is located approximately 25 km north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson Bay, the Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1’23.8’’ N, 92°13’6.42"W), on Inuit Owned Lands (IOL).

The scope of the TEMMP Annual Report is to report on terrestrial monitoring activities for the Project throughout its various phases of development. This report includes data collected in 2021, reflecting the fourth year of operations. Project site facilities include a plant site and accommodation buildings, a water management system that includes collection ponds, water diversion channels, retention dikes/berms, and water treatment plants. Project components include two ore stockpiles, a temporary overburden stockpile, a tailings storage facility, two waste rock storage facilities, a landfarm, incinerator, and landfill.

Environmental baseline studies were completed in the Project area prior to Project approval and integrated into the current project design according to the TEMMP (Agnico Eagle 2020a). Vegetation and wildlife Valued Ecosystem Components (VECs) were identified in consultation with regulatory agencies, the Kivalliq Inuit Association (KivIA) and the Kangiqliniq Hunters and Trappers Organization (KHTO). Vegetation VECs include plant populations and communities, listed (rare) plant species, and traditional use plant species. Wildlife VECs include ungulates (caribou [*Rangifer tarandus groenlandicus*] and muskox [*Ovibos moschatus*]), carnivores (grey wolf [*Canis lupus*] and polar bear [*Ursus maritimus*]), raptors, waterbirds, and upland birds (including migratory birds). Further details on VEC selection can be found in the FEIS (Golder 2014) and the TEMMP (Agnico Eagle 2020a).

1.2.1 Concordance with Terms of Reference

The NIRB Project Certificate (No. 006) for the Meliadine Gold Mine was issued on 26 February 2015, and Amendment 001 was issued 26 February 2019, and Amendment 002 was issued 2 March 2022. This fourth iteration of the TEMMP Annual Report addresses the Terms and Conditions of Project Certificate No.006 as they relate to the TEMMP. Concordance as reflected in Table 1.

NIRB recommends the following related to standardization of data for monitoring programs:

> *"all monitoring plans should be designed so that results from these programs can be coordinated with ongoing regional initiatives or programs with relevant government organizations, or regional authorities." NIRB guidelines, Section 9.3, page 78-79.*
>
> *"When designing data collection or baseline studies, it is recommended that the Proponent coordinate with ongoing programs with relevant developments, government organizations, regional authorities, and researchers. This recommendation applies to data collected for the Nunavut General Monitoring Program (NGMP), as per Article 12 of the NLCA, the Proponent's project-specific monitoring programs, as well as any regional monitoring initiatives in which the Proponent will participate. The Proponent is expected to coordinate on any initiatives undertaken by government organizations in respect to the NGMP and to liaise with the NGMP Secretariat whenever possible." NIRB guidelines, Section 7.7.1, page 40-41.*

Agnico Eagle will comply with these principles and has already established several programs that involve collaborations with regional initiatives and contribute to monitoring cumulative effects. These include:

- **Caribou Collar Program:** Support the Government of Nunavut's (GN) caribou satellite-collaring program for the Qamanirjuaq herd (and other herds in the Kivalliq Region), facilitating monitoring of cumulative effects at the herd level (Agnico Eagle 2020a; Sections 2.2 and 4.7).
- **Hunter Harvest Program:** Agnico Eagle has signed a memorandum of Understanding (MOU) with the KHTO in March 2019 and renewed in June 2020, which includes methods to document caribou harvesting around the Meliadine Mine, and to participate in Mine site studies and monitoring (Agnico Eagle 2020a; Section 4.8). This will contribute to an understanding of cumulative effects by increasing understanding of the regional distribution and seasonality of hunting. A collaboration agreement between Agnico Eagle and the KHTO was also signed in 2021, for similar purposes.
- **Raptor Monitoring Program:** Agnico Eagle, in collaboration with the Arctic Raptor Project implemented a raptor monitoring program (Agnico Eagle 2020a; Section 4.9). This will directly align monitoring efforts at Meliadine with this long-term regional research program which involves government, non-government, Indigenous communities, and academic partnerships.
- **Waterfowl and Shorebird Monitoring:** Agnico Eagle, in collaboration with Environment and Climate Change Canada (ECCC), have agreed to implement the Program for Regional and International Shorebird Monitoring (PRISM) (Agnico Eagle 2020a; Section 4.11). This will directly align monitoring efforts at Meliadine with other Agnico Eagle properties for waterfowl and shorebirds.
- **Wildlife Surveys:** Agnico Eagle, in collaboration with the KHTO, will conduct wildlife surveys along the AWAR and with Environmental Technicians around the Mine site. This will contribute to an understanding of cumulative effects in the region by collecting routine wildlife survey data (including caribou) and assist in

anticipating large herd migrations, communicating with the KHTO and managing mine activities during migration events.

Table 1: Concordance Table with NIRB Project Certificate No. 006 Terms and Conditions

Term	Condition	Section
37	The Proponent shall incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g., surveys of plant populations in previously disturbed areas) into its Terrestrial Environment and Monitoring Plan. Any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.	7.0
38	The Proponent shall conduct sampling to determine baseline levels for metals in soils found in areas with berry-producing plants near the Project area and shall update relevant vegetation sections within the Terrestrial Management and Monitoring Plan to incorporate ongoing monitoring of these parameters prior to commencing operations.	6.0
39	The Proponent shall develop and establish an on-going monitoring program to determine the distribution, abundance, and health of vegetation species used as caribou forage (such as lichens) near Project areas, prior to commencing operations.	5.1, 6.0
40	The Proponent shall review, on an annual basis, all monitoring information and the vegetation mitigation and management plans developed under its Environmental Management Plan and Terrestrial Environment and Monitoring Plan (TEMMP) and adjust such plans as may be required to effectively prevent or reduce the potential for significant adverse project effects on vegetation abundance, diversity and health, taking into account lessons learned at other northern mining developments where appropriate.	5.1, 6.0
45	The Proponent shall demonstrate consideration for cooperating with existing and planned regional and/or community-based monitoring initiatives associated with terrestrial wildlife and wildlife habitat that produce information pertinent to mitigating project-induced impacts. The Proponent shall give special consideration for supporting regional studies of population health and harvest programs for Qamanirjuaq caribou which help address areas of uncertainty for Project impact predictions.	1.2.1, 8.3, 12.0
46	The Proponent shall update its Terrestrial Environment Management and Monitoring Plan (TEMMP) for the Project to include a detailed harvest study prepared in consultation with the Government of Nunavut (GN) and other affected parties. The design of the harvest study should demonstrate consideration for the following: a. Hiring of a dedicated local survey coordinator through local Hunters and Trappers Organizations (HTOs) and provision of adequate resources for the HTOs to run the program; b. The potential effects on caribou populations and on caribou behaviour resulting from increased human access caused by the all-weather access road and associated roads and trails; and, c. Increasing local knowledge of the project development areas, including establishing baseline harvesting levels prior to unrestricted public access on the all-weather access road.	13.0
47	The Proponent shall share information with the Government of Nunavut (GN) relating to the migration of caribou and include the GN as a party respecting caribou monitoring and movement through Project development areas, including the all-weather access road and associated roads and trails.	12.1, 12.2
52	The Proponent shall undertake periodic surveys and a habitat assessment for muskoxen in the regional study area by partnering with, or complementing, the existing regional muskox monitoring programs.	11.0
55	In consultation with the Government of Nunavut (GN) and other affected parties, the Proponent shall set thresholds for direct mortality of wolf, grizzly bear, polar bear, wolverine, and fox to ensure monitoring and mitigation for the Project is responsive to undesirable rates of mortality. The Proponent shall reach an agreement with the appropriate Designated Inuit Organization regarding compensation or any direct mortality of wildlife resulting from the Project.	9.2
56	The Proponent shall report annually to the NIRB regarding its terrestrial environment monitoring efforts, with inclusion of the following information: a. Description of all updates to terrestrial ecosystem baseline data; b. A description of the involvement of Inuit in its monitoring programs; c. A detailed presentation and analysis of the distribution relative to Project infrastructure and activities for caribou and other terrestrial mammals observed during surveys and incidental sightings; d. Results of the annual monitoring program, including field methodologies and statistical approaches used to support conclusions drawn; and, e. An assessment and presentation of annual environmental conditions including timing of snowmelt, green-up, as well as standard weather summaries.	1.2.1, 3.0, and 4.0, 9.1, and 12.1

Table 1: Concordance Table with NIRB Project Certificate No. 006 Terms and Conditions

Term	Condition	Section
57	Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes: a. An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting; b. A detailed analysis of wildlife responses to operations with emphasis on wildlife behaviour, mortalities and displacements (if any), and responses to operations of the all-weather access road and associated access roads/trails; c. A demonstration and description of how the monitoring results, including the all-weather access road and associated access roads/trails contribute to cumulative effects of the project; and, d. Any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program.	8.2.3.2, 9.1, and 12.1
59	If Species at Risk or their nests and eggs are encountered during Project activities or monitoring programs, the primary mitigation measure must be avoidance. The Proponent shall establish clear zones of avoidance based on the species-specific nest setback distances outlined in the Terrestrial Environment Management and Monitoring Plan.	9.4
61	Prior to bird breeding season, the Proponent shall either conduct clearing activities or identify and install nesting deterrents (e.g., flagging) to discourage birds from nesting in areas likely to be disturbed by construction/clearing activities. If clearing is to take place during the nesting season, a nest survey should take place to identify nests and any identified nests must remain undisturbed until the young have fledged or left the nest. Any nests identified shall be included as part of the annual reporting for the Terrestrial Environmental Mitigation and Monitoring Plan (TEMMP).	9.4, 10.0
62	The Proponent shall protect any nests found (or indicated nests) with a buffer zone determined by the setback distances outlined in its Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), until the young have fledged. If it is determined that observance of these setbacks is not feasible, the Proponent will develop nest-specific guidelines and procedures to ensure bird's nests and their young are protected.	9.4 and 10.0
71	The Proponent shall develop detailed and robust mitigation and monitoring plans for migratory birds, reflecting input from relevant agencies, the Kivalliq Inuit Association and communities.	8.0
72	The Proponent shall continue to develop and update relevant monitoring and management plans for migratory birds under the Proponent's Environmental Protection Plan and Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) prior to construction. The key indicators for follow up monitoring under this plan will include upland birds (including migratory birds), waterbirds, raptors, and seabirds including migration and wintering.	8.0
73	The Proponent's monitoring program shall assess and report, on annual basis, the extent of terrestrial habitat loss due to the Project to verify impact predictions and provide updated estimates of the total Project footprint.	5.1
105	The Proponent is strongly encouraged to consider incorporating information obtained from local outfitting and guiding businesses into its Hunter Harvest Survey where possible, and to include these organizations as potential respondents to surveys undertaken.	13.0
118	The Proponent shall include in an updated Terrestrial Wildlife Management and Monitoring Plan (TEMMP), plans for increased caribou monitoring efforts including weekly winter track surveying and summer and fall surveys undertaken on foot twice per month. These results shall be reported to the NIRB with the Proponent's annual reporting requirements.	12.5
119	The Proponent shall include within its updated Terrestrial Wildlife Management and Monitoring Plan, a commitment to establishing deterrents along the AWAR at any areas where it is observed that caribou are attracted to the AWAR and their presence may present a risk of collisions with traffic along the AWAR (such as areas where caribou are utilizing the AWAR to facilitate movement, areas where caribou may be licking minerals/road salt from the road, areas where caribou are gathering to avoid insects, etc.).	TEMMP (Agnico Eagle 2020a) Appendix IV – Wildlife Protection and Response Plan

1.3 Study Area Boundaries

The Local Study Area (LSA) includes a 500 meter (m) buffer around the Project footprint and includes a 1,000 m buffer on the AWAR, Discovery Access Road and the Rankin Inlet Bypass Road. The total area of the LSA is 10,598 hectares (ha) (Figure 1).

The Regional Study Area (RSA) encompasses an area that includes a 28 km radius centered around the Project, including Rankin Inlet for a total area of 246,300 ha (Figure 2).

Further details on the justification for study area sizes can be found in the FEIS (Golder 2014) and the TEMMP (Agnico Eagle 2020a).

530000
540000
550000
560000
6990000
6980000
6970000

Lake

Tiriganiaq Deposit

Meliadine Lake

Parallel Lake

All-weather Access Road

Little Meliadine Lake (LML)

Iqalugaarjuup Nunanga Park

Meliadine River

Meliadine River Bridge

Manned Gate

Char River Bridge

Municipal Road

Prairie Bay

Rankin Inlet Bypass Road

Rankin Inlet

Hudson Bay

LEGEND

- MINE INFRASTRUCTURE (2021)
- MINE FOOTPRINT (2021)
- APPROVED PROPOSED TERRESTRIAL LOCAL STUDY AREA (LSA)
- ALL-WEATHER ACCESS ROAD (AWAR)
- RANKIN INLET
- WATERCOURSE
- WATERBODY
- TERRITORIAL PARK

0 2,500 5,000

1:125,000 METRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE LIMITED.
2. DATUM: NAD83 PROJECTION: UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

AGNICO EAGLE

PROJECT

MELIADINE GOLD PROJECT
NUNAVUT

TITLE

PROJECT LOCAL STUDY AREA

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-04-04
DESIGNED	SW
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
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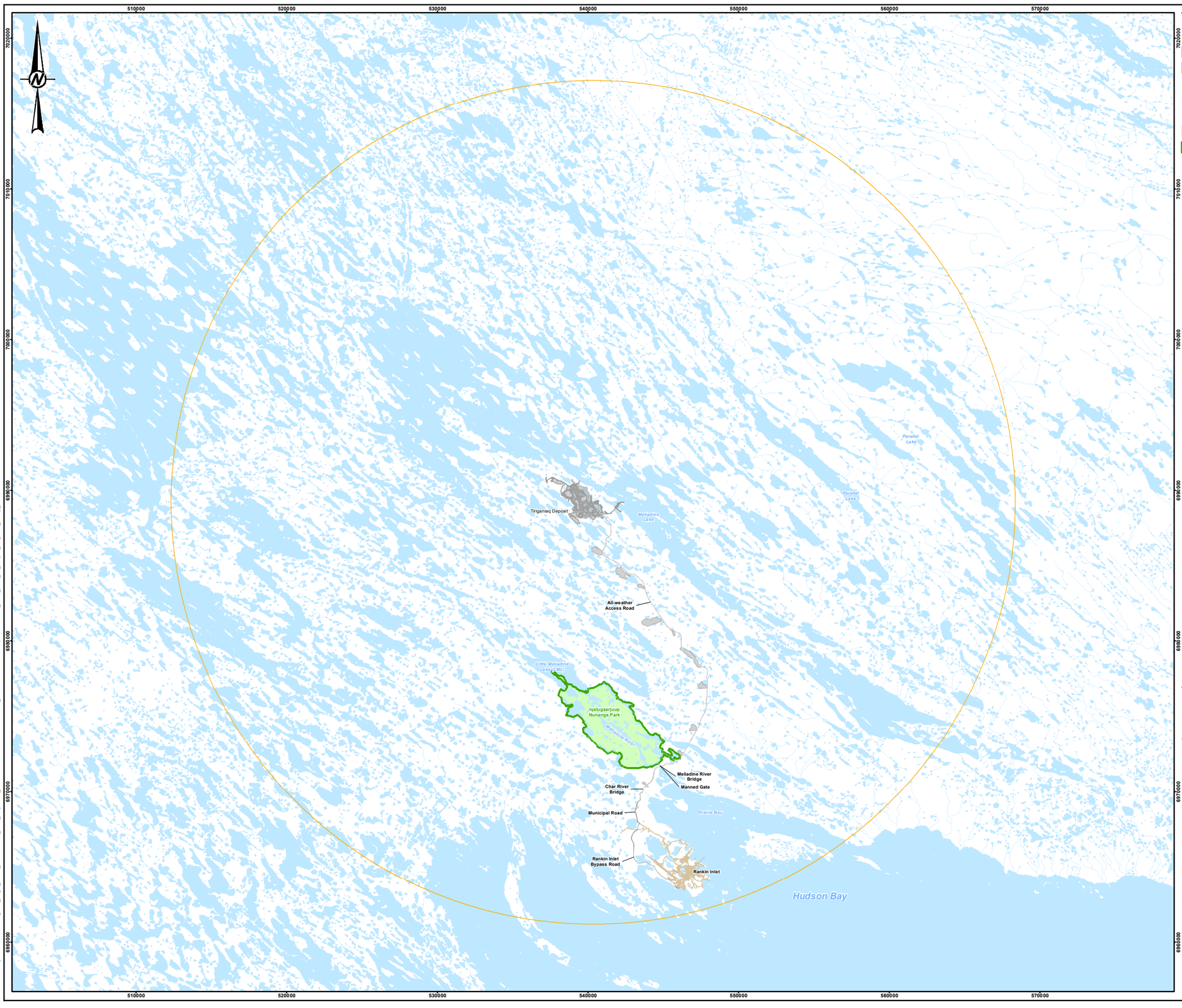
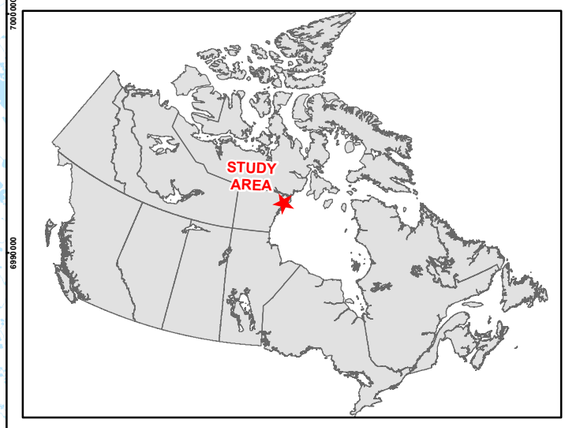


LEGEND

- MINE INFRASTRUCTURE (2021)
- MINE FOOTPRINT (2021)
- REGIONAL STUDY AREA (RSA)
- ALL-WEATHER ACCESS ROAD (AWAR)
- RANKIN INLET
- WATERCOURSE
- WATERBODY
- TERRITORIAL PARK



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1:250,000 KILOMETRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE LIMITED.
2. DATUM: NAD83 PROJECTION: UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

AGNICO EAGLE

PROJECT

MELIADINE GOLD PROJECT
NUNAVUT

TITLE

PROJECT REGIONAL STUDY AREA

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-04-04
DESIGNED	CC
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
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1.4 Monitoring Approach

Wildlife monitoring is an essential tool in protecting and maintaining wildlife in the vicinity of the Project. A comprehensive monitoring strategy has been implemented and, as required, is adapted to meet the objectives of the management strategy and methods set out in the TEMMP (Agnico Eagle 2020a). Monitoring programs evaluate the effectiveness of mitigation measures and assess Project-related effects predictions. For all wildlife monitoring programs there is a certain level of uncertainty or unpredictability; therefore, residual effects identified during monitoring may require implementation of adaptive management strategies. Outcomes of adaptive management may include increasing, decreasing, or no change to mitigation and/or monitoring or implementing special studies to further understand Mine-related effects.

To evaluate the accuracy of effects predictions, a series of quantitative monitoring indicators have been developed within the broad categories of habitat distribution, wildlife distribution, wildlife richness, wildlife diversity, wildlife abundance, and environmental health. The fifth year of overall monitoring per the TEMMP occurred in 2021, and the third year under operations for the Mine. Previous monitoring was conducted during the construction phase. Consequently, some of the objectives below may not be answered at this time or will be addressed qualitatively until more data under operations is obtained.

1.5 Objectives

The primary objectives of this 2021 TEMMP Annual Report include:

- Collecting information that will assist Agnico Eagle to determine if there are effects on the terrestrial environment and if these effects were accurately predicted in the FEIS.
- Reporting the results of the 2021 monitoring programs.
- Summarizing the monitoring strategy implemented over the course of the year.
- Evaluating the function and validity of implemented monitoring strategies.
- Summarizing adaptive management strategies.
- Providing management recommendations for 2021.
- Allowing regulators to contribute advice for improving monitoring and management.

1.6 Report Organization

Within each section of this report, data is presented that will be tracked over the life of the Project. Recommendations for enhancement to the TEMMP are presented at the end of each section for consideration and may be incorporated into the TEMMP for subsequent years. The TEMMP is an evolving program that will reflect recommendations during previous years, as well as advances in Project development. Changes will be captured in future revisions of the TEMMP as needed.

2.0 REVIEW OF IMPACT PREDICTIONS

A summary of the impact predictions proposed in the updated TEMMP (Agnico Eagle 2020a) is provided in Table 2. If Project impacts exceed the thresholds, an internal review of mitigation is triggered and adaptive management is implemented where applicable. The corresponding sections of this TEMMP Annual Report where monitoring indicators are discussed are also listed.

Table 2: Summary of Predicted Effects, and Accuracy of Impact Predictions

Monitoring Indicator	Proposed Thresholds	Surveyed in 2021?	Exceeded in 2021?	Monitoring Methods	Frequency of Data Collection	Section Reference
Vegetation (Wildlife Habitat)						
Habitat Loss	No greater than: Terrestrial – 2,950 ha Aquatic – 515 ha	Yes	No	Aerial photographs, satellite imagery, ground surveys, GIS analysis	Every 3 Years	5.0
Habitat Degradation by Contamination	No effects to plant health from dust deposition SLRA – TBD	No	NA	Vegetation and Soil Samples	Every 3 Years	NA
Habitat Reclamation following Mine Closure	NA	No	NA	Ground Surveys, Vegetation Plots, Mapping	Once pre-construction baseline (2017) and 3 times Post-Closure	NA
Habitat Degradation by Contamination	No non-native plant species established	Yes	No	Invasive Plant Survey of AWAR and Project site	Annually	7.0
Ungulates						
Habitat Loss and Degradation	No greater than 2,950 ha of terrestrial habitat loss	Yes	No	Aerial photographs, satellite imagery, ground surveys, GIS analysis	Every 3 Years	5.0
Sensory Disturbance	<10% caribou deflections from AWAR	No	NA	Caribou Behaviour Monitoring	Annually	12.3
Vehicle Collisions	No more than 1 ungulate/year	Yes	No	Wildlife Sightings Log, Site Surveillance Monitoring, AWAR Road Surveillance, Road Surveillance	Daily	9.5
Hunting by Rankin Inlet Residents	TBD after 3 years of data collection, in collaboration with GN	No	NA	Hunter Harvest Study	Collected throughout the year and reported annually	13.0
Other Project-related Mortality	No more than 1 ungulate/year	Yes	No	Wildlife Sightings Log, Site Surveillance Monitoring, AWAR Road Surveillance, Road Surveillance	Daily	9.5
Exposure to Contaminated Water or Vegetation	SLRA – TBD	No	NA	Vegetation and Soil Samples	Every 3 Years	NA
Predatory Mammals						
Project-related Mortality	No more than 1 Arctic fox/year	Yes	Yes	Wildlife Sightings Log, Site Surveillance Monitoring, AWAR Road Surveillance, Road Surveillance. No trapping in 2020	Daily	9.5
Raptors						
Disturbance of Nesting Raptors	To be determined in consultation with GN and Alastair Franke, related to occupancy and productivity.	No	NA	Active Nest Monitoring	Nests within 200 m – Daily Nests from 200 to 1,000 m – Weekly	NA
Project-related Mortality	No more than 1 raptor/year	Yes	No	Wildlife Sightings Log, Site Surveillance Monitoring, AWAR Road Surveillance, Road Surveillance	Mine Site-Daily AWAR – 2x/Week	9.5
Waterbirds						
Habitat Loss and Degradation	No more than 515 ha of aquatic habitat	Yes	No	Aerial photographs, satellite imagery, ground surveys, GIS analysis	Every 3 Years	5.0
Disturbance of Nesting Waterfowl	TBD once NRV is established through consultation with ECCC and GN	Yes	NA	Shoreline Surveys	Annually	9.4
Exposure to Contaminated Water or Vegetation	SLRA – TBD	No	NA	Vegetation and Soil Samples	Every 3 Years	NA
Project-related Mortality	No more than 1 waterbird/year	Yes	No	Wildlife Sightings Log, Site Surveillance Monitoring, AWAR Road Surveillance, Road Surveillance	Mine Site-Daily AWAR – 2x/Week	9.5
Other Breeding Birds						
Habitat Loss and Degradation	No greater than 2,950 ha of terrestrial habitat loss	Yes	No	Aerial photographs, satellite imagery, ground surveys, GIS analysis	Every 3 Years	5.0
Exposure to Contaminated Water or Vegetation	SLRA – TBD	No	NA	Vegetation and Soil Samples	Every 3 Years	NA
Changes in Breeding Bird Populations	TBD once NRV is established through consultation with ECCC	Yes	NA	Breeding Bird Plots and Transects, PRISM	Breeding Bird – Every 3 Years PRISM – Plots surveyed over 2 years every 5 Years	8.0

Notes: AWAR = All-Weather Access Road; ECCC = Environment and Climate Change Canada; GN = Government of Nunavut Department of Environment; NRV = Natural Range of Variability; PRISM – Program for Regional and International Shorebird Monitoring; SLRA = Screening Level Risk Assessment; TEMMP = Terrestrial Environment Management and Monitoring Plan (Agnico Eagle 2020a); ha = hectares; m = metres; NA = not applicable; TBD = to be determined.

3.0 INCORPORATION OF INUIT QUAJIMAJATUQANGIT

Inuit Qaujimajatuqangit (IQ) was collected through site visits and meetings between 11 March and 10 October 2021 (Table 3). Additional records of IQ consent and validation are provided in Appendix A.

Table 3: Inuit Qaujimajatuqangit captured for Meliadine in 2021

Date	Topic	Participants	Venue	Inuit Qaujimajatuqangit
5/31/21	No Shooting Rules	Rankin Elders: Jack Kabvitok Aline Kabvitok Levenia Brown Jack Nakoolak Rosie Oolooyuk	Pre road show in Rankin Inlet*	■ Elders indicate discrepancy between TEMMP and laws of Nunavut where right to hunt is guaranteed under Nunavut Agreement. Laws need to change to reflect harvesters' rights.
6/18/21	Inaugural Elders Advisory Committee meeting in person in Rankin	Jack Kabvitok Aline Kabvitok Rosie Oolooyuk Leo & Leonie Mimialik Eva Voisey Louie Oklagah Peter Aulatjut Martin & Mary Kreelak Thomas Ubluriaq	Kivalliq Elders Advisory Committee*	■ Elders raised concerns about dust and ability to pick berries by the AWAR. Indicated that berry pickers now avoid berries near AWAR. ■ Jack Kabvitok indicated that mines are not responsible for the decline in health of caribou. The weather is changing and the streams are getting lower. ■ Jack Kabvitok indicated that ATV are ruining the lands and wants hunters to share the mine roads to avoid degradation.
6/19/21	MEL AWAR site visit	Jack Kabvitok Aline Kabvitok Rosie Oolooyuk Eva Voisey Louie Oklagah Peter Aulatjut	Bus tour	■ Elders provided advice to Meliadine Operations on type of aggregates to cover line to old exploration camp and if height of aggregate is ok to ensure caribou crossing. Elders suggested type of aggregates and confirmed the sloping is acceptable.
10/10/21	Rankin Elder visit	John Tatty Jack Kabvitok Barny Tootoo	meeting	■ Jack, as former KHTO chair, recalled mine was to build a road to Discovery and a boat launch. ■ Best road to Itirlak (Discovery) is on the high esker at Km 19.
3/11/21	ATV trails identification	Jack Kabvitok John Tatty David Kritterdlik	Site visit via ATV with Environment	■ Identification of ATV trails at km 9 and 19 (trail to Itirlak) along with areas of concerns due to overuse by hunters on ATV. ■ Identify potential location for parking at new proposed boat launch at Itirlak. ■ GPS mapping of existing ATV trail at km 19 with Environment Coordinator.

Table 3: Inuit Qaujimajatuqangit captured for Meliadine in 2021

Date	Topic	Participants	Venue	Inuit Qaujimajatuqangit
3/11/21	Cabin Owners Committee	meeting minutes* Jackie Nakoolak	In person meeting at Waiting Room	■ Due to helicopter activity and since the development if the Meliadine Mine there is a lot less caribou traffic on the traditional route (Meliadine and Diana river crossings) in both spring and fall. ■ No difference or concerns about the quality of the caribou and fish meat. It is not an issue. ■ Eats caribou meat every day that is prepared in various ways. ■ Fish, (char) is weekly staple. ■ Supplements diet with other artic foods and when seasonally available or shared by relatives or local harvesters and fishers: ■ Does all his own hunting and fishing ■ Concerned that this powder that becomes clearly visible on snow in the winter times seeps into the ground and the lakes, river and streams and may affect the quality of the vegetation that the fish and land mammal eat; ■ Could this powder like substance become a sediment of concern for human health for the countless locals that use the water from the Meliadine lake, river and streams throughout the year? ■ Wondered what the dark, fine powder like matter that appears on top of the snow approximately over a 2- or 3-mile radius around the Meliadine mine site is; ■ Is it residue that rises above ground from the underground blasting?

* indicates minutes are available”

Field programs were guided by IQ, including the assistance of local field assistants whenever possible. Local participation in monitoring programs was limited in 2021 in consideration of COVID-19 health and safety measures for the protection of local communities. However, the TEMMP work completed in 2021 was 100% contact free and conducted in strict accordance with applicable protocols and health and safety measures (e.g., Detached Operation Protocol).

4.0 ENVIRONMENTAL VARIABLES

A summary of climate conditions collected on site in 2021 are presented in Table 4. Data was collected from 1 January to 31 December 2021 through the on-site meteorological station and rain gauges.

Table 4: Climate Conditions Recorded in the Project Area (2021)

Environmental Variable	Value[a]
TEMPERATURE (°C)	
Mean Annual Temperature	-8.3
Max. Annual Temperature	27.4
Min. Annual Temperature	-39.8
PRECIPITATION	
Total Annual Precipitation (mm)	366.2[b]

a) Values reported from 1 January to 31 December, collected by Agnico Eagle staff.
b) Measured using Geonor Precipitation Gauge. Values were excluded on 14 November 2021 and 9 December 2021 due to precipitation gauge maintenance or sensor error.
Notes: °C = Celsius; mm = millimetres.

The maximum annual temperature of 27.4°C was recorded on 15 July 2021 and the minimum annual temperature -39.8°C was recorded on 27 February 2021; the mean annual temperature was -8.3°C (Table 4). Total recorded annual precipitation was 366.2 mm and snowmelt began 29 May 2021 when the average daily air temperature exceeded 0°C. Total precipitation includes both rain and snowfall. The precipitation gauge uses vibrating wire technology, which is very sensitive to movement or wind. High winds may induce erroneous data, including negative values. Negative values could also be caused by evaporation of the antifreeze mixture in the gauge, which is used to melt solid precipitation and impede evaporation. Environmental variables will continue to be monitored on an on-going basis.

5.0 HABITAT LOSS

5.1 Direct Habitat Loss

The vegetation component of the TEMMP (Agnico Eagle 2020) outlines how Agnico Eagle plans to reduce Project-related effects to vegetation populations and communities and, consequently, wildlife habitat.
The monitoring plan includes both environmental and follow-up monitoring. The objective of this component of the TEMMP Annual Report is to determine if direct vegetation/habitat loss due to the Project footprint stays within impact prediction of 2,950 ha (Golder 2014).

The Project footprint was and reported in the 2018 TEMMP Annual Report (Agnico Eagle 2019). The footprint that was analyzed included all developments being completed as part of the construction phase. Follow-up monitoring occurs at three-year intervals, with the next scheduled for 2024. The follow-up monitoring is used to provide feedback to Mine operations to determine if the goals and objectives are being met.

5.1.1 Methods

The Project development area was delineated through aerial photographs, satellite imagery, and historical ground surveys, and calculated using ArcGIS software. The actual area of the Project footprint will be compared to the permitted area and monitored over the life of the Project at key phases of development, or at 3-year intervals (Golder 2015).

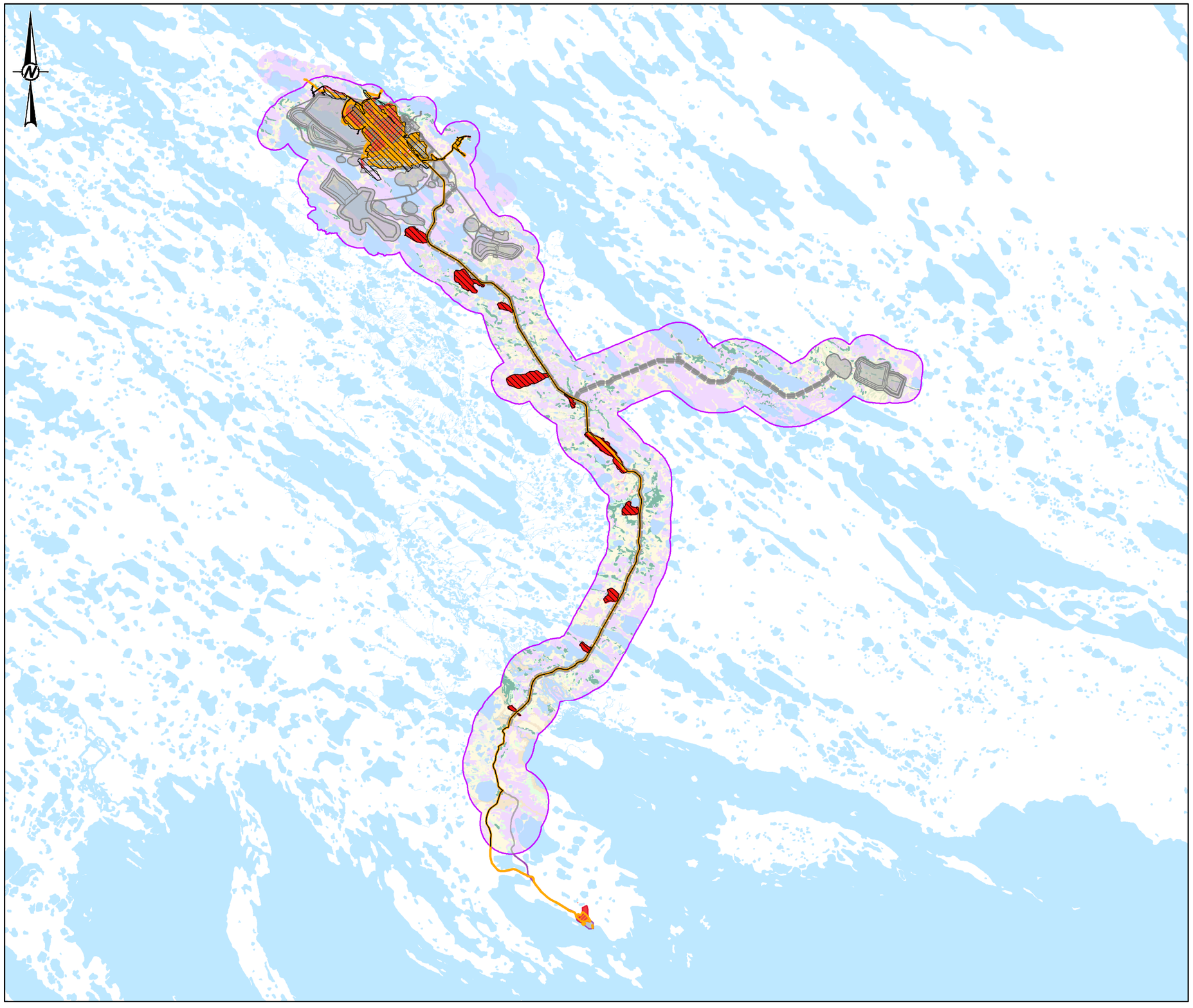
A CAD file with the most current Project footprint from 2021 was obtained from Agnico Eagle and digitized to determine impacts to vegetation communities/habitat type due to the Project. The footprint layer was compared against 2021 Satellite imagery and laid over the vegetation unit layer available for the Project and developed by Golder (2012). Each vegetation community/wildlife habitat disturbed by the Project was selected and calculations were made using ArcGIS to determine the area (ha) of each habitat type replaced by the Project footprint.

Changes to vegetation communities/habitat types were assessed for the maximum predicted Project footprint (Golder 2015), which should have the largest magnitude and geographic extent of effects to vegetation. The maximum predicted Project footprint includes Project site and associated infrastructure (e.g., tailings storage facility [TSF], open pits, waste rock storage facilities, and camp), the AWAR between the Project and Rankin Inlet and the proposed infrastructure within the boundary of the Hamlet of Rankin (associated roads, floating dock, laydown yard and tank farm).

A portion of the bypass road connecting Rankin Inlet and the AWAR (Figure 3Figure) was not included in this assessment because this portion was developed outside the original Project LSA as per the Hamlet's instruction. This portion of the road is 4 km in length and 10 m wide.

5.1.2 Results

As of January 2022, a total area of 633 ha has been altered due to Project construction, representing 38% of the 2012 Project Approved footprint (1,682 ha) and 21% of the predicted Project Footprint (2,950 ha (Golder 2014). Table 5 summarizes the impacts by each vegetation community/habitat type. A total of 438 ha of vegetated heath types have been impacted by the Project (26% of the predicted impacts). The wetland riparian types have been impacted by Project by 138 ha (8% of the predicted impacts). In total 57 ha of un-vegetated sand community have been impacted due to the Project (3% of predicted impacts) (Figure 3).



LEGEND

- MINE FOOTPRINT (2021)
- MINE FOOTPRINT (2018)
- PROPOSED PROJECT INFRASTRUCTURE (2012)
- APPROVED MINE FOOTPRINT (NIRB PROJECT CERTIFICATE NO. 006)
- APPROVED TYPE A WATER LICENCE FOOTPRINT (NWB 2AM-MEL1631)
- APPROVED PROPOSED TERRESTRIAL LOCAL STUDY AREA (LSA)
- ALL-WEATHER ACCESS ROAD (AWAR)
- WATERCOURSE
- WATERBODY

PLANT COMMUNITY CLASSIFICATION

- BIRCH SEEP
- DISTURBED
- HEATH TUNDRA COMMUNITY
- LICHEN-HEATH (CETRARIA LICHEN)
- LICHEN-HEATH (HAIR LICHEN)
- LICHEN-ROCK COMMUNITY
- RIPARIAN WILLOW OR BIRCH
- SEDGE COMMUNITY
- UNVEGETATED SAND
- WATER

0 2,500 5,000

1:125,000 METRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
DATUM: NAD 83 PROJECTION: UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

AGNICO EAGLE

PROJECT

MELIADINE GOLD PROJECT
NUNAVUT

TITLE

PROJECT FOOTPRINT COMPARISON BY VEGETATION COMMUNITY/HABITAT TYPE

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-04-04
DESIGNED	AO
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
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Table 5: Total and Predicted Vegetation Community/Habitat Type loss from Project approval to 2021

Vegetation Community Type	Vegetation Community Type Description	Total Area of LSA [ha]	Project Predicted Impacts [ha] [a]	Approved 2012 Project Footprint [ha] [b]	2018 Project Impacts [ha]	2021 Project Impacts [ha] [c]
Heath						
Lichen-Rock Community	characterized by crustose lichens growing on the boulders or rocks that predominate on eskers or rocky plateaus	233	43	37	28	25[e]
Lichen-Heath (*Cetraria* Lichen)	occurs on lower slope positions, often below the lichen-health – hair lichen community, on more rapidly drained sandy substrates	560	131	86	35	46
Lichen-Heath (Hair Lichen)	occurs almost exclusively on the higher ridges of slopes and on drumlin and esker crests, where the ground cover consists of a high percentage of black and green hair lichens	601	156	110	59	69
Heath Tundra Community	occurs on uplands and slopes of most ridges characterized by gently rolling to undulating terrain with rapidly to well-drained soils	4,036	1,250	722	222	297
	Heath subtotal	***5,429***	***1,581***	***956***	***343***	***438***
Wetland/Riparian						
Birch Seep	occurs on imperfectly poor to poorly drained soils such as the edges of solifluction lobes, on the slopes of some eskers, in stream valleys and along transitions to some sedge associations	305	109	87	10	11
Sedge Community	occurs adjacent to lakes and streams on very poorly drained soils and in low-lying areas	2,449	562	1	85	127
Riparian Willow or Birch	typically occurs along the banks of stream courses; characterized by imperfectly drained, nutrient enriched soils	12	2	351	<1	<1
	Wetland/Riparian subtotal	***2,767***	***702***	***440***	***95***	***138***
Un-vegetated						
Disturbed [d]	cleared areas and access roads associated with the Project as well as various natural disturbance features	<1	0	<1	<1	<1
Un-vegetated (Sand)	associated with steep sandy slopes and the margins of rivers and lakes; limited to no vegetation cover	182	36	8	6	5

Table 5: Total and Predicted Vegetation Community/Habitat Type loss from Project approval to 2021

Vegetation Community Type	Vegetation Community Type Description	Total Area of LSA [ha]	Project Predicted Impacts [ha] (a)	Approved 2012 Project Footprint [ha] (b)	2018 Project Impacts [ha]	2021 Project Impacts [ha] (c)
Water	associated with waterbodies and watercourses	2,221	631	278	40	52
un-vegetated subtotal		***2,403***	***666***	***286***	***46***	***57***
Total		**10,598**	**2,950**	**1,682**	**484**	**633**

a) Project predicted Impacts from Project FEIS (Golder 2014)
b) 2012 Approved Project Footprint
c)Impacts to vegetation communities/habitat types from Project approval to December 2021.
d)Disturbance include areas that were already disturbed at baseline conditions when the vegetation community/habitat type mapping was developed.
e)Habitat loss was estimated based on CAD file and footprint updates provided by Agnico Eagle annually. The project footprint has been adjusted as the project progresses; therefore, some vegetation communities may show higher impacts in 2018 than in 2021.
Note: Some numbers are rounded for presentation purposes; totals may not equal the sum of the individual values.

5.1.3 Recommendations

Although, Project footprint is currently 38% of the total approved footprint, follow up monitoring should continue to occur at 3-year intervals, as monitoring studies are used to provide feedback to Project operations to determine if the goals and objectives are being met. Depending on the results, actions may be considered such as modifying and/or implementing additional mitigation.

5.2 Accuracy of Impact Predictions

Impact predictions related to habitat loss is summarized in Table 5. Terrestrial and aquatic habitat loss is currently below predictions. Effects to plant health from dust deposition were not scheduled for assessment in 2021. Plant health related to dust deposition is assessed at 3-year intervals from baseline (2017) as per the TEMMP (Golder 2015). The second assessment was scheduled for 2019 to align with the first year of construction, the next assessment is to occur in 2022.

5.3 Indirect Habitat Loss

Indirect effects to wildlife are associated with changes in habitat that can alter the movement and behaviour of individuals in the vicinity of the Project as a result of sensory disturbance. Indirect effects are addressed through several of the monitoring programs per the TEMMP.

Caribou behaviour monitoring is presented in Section 12.0 of this report. For nesting birds, site-specific nest management plans may be required if birds are within the Project footprint. For the 2021 monitoring period, indirect Project effects on nesting birds are addressed in Section 9.4.

Indirect Project effects are assessed through soils and vegetation monitoring every three years. Monitoring of indirect habitat loss assessment was last completed in 2019 (Golder 2020), therefore, the next assessment will be completed in 2022.

6.0 SOIL AND VEGETATION MONITORING

The scope of the landscape component of the TEMMP Annual Report is to report on baseline levels of metals in berry producing plants, sedges, lichen, and soil chemistry potentially affected by the Mine. To evaluate the potential for adverse health effects to terrestrial life associated with changes in environmental quality due to chemical releases from the Mine, baseline conditions of the environment must first be understood. Vegetation and soil annual monitoring was conducted in 2017 to inform the baseline conditions. Monitoring programs are completed at 3-year intervals, with monitoring completed in 2019 (Agnico Eagle 2020b) and the next assessment to be completed in 2022.

Local vegetation cover is predominantly characterized by heath tundra, and lichen-heath communities. Low-lying areas between the drumlins and eskers are dominated by sedge wetlands, shallow ponds, and various shallow and deep-water lakes. The main change from the Mine on the landscape is direct disturbance, which will be a long-term effect as the recovery of vegetation is slow in arctic environments (Burt 1997).

7.0 NON-NATIVE PLANT SURVEYS

The spread of non-native species across the landscape is a concern for the Inuit. Construction equipment and operation activities can result in the introduction of, or spread of, non-native vegetation species. Thus, Project Certificate No. 006 includes Term and Condition 36 and 37 to prevent and minimize the introduction of non-native plants during pre-construction, construction, operations, temporary closure and maintenance, closure and post-closure. Pre-construction surveys were completed during the baseline studies completed during 1998, 2008 and 2009 surveys (Volume 6, SD 6-5; Golder 2014).

This section includes the methods, results, and mitigation measures to minimize the spread of non-native invasive plant species resulting from Project construction. The Government of Nunavut (GN) and Environment and Climate Change Canada (ECCC) define a non-native species as ‘an organism that is not normally found in a region’ (CESCC 2010). Any introductions of non-native plant species must be promptly reported to the GN Department of Environment. Non-native plant monitoring surveys occurred in 2018 prior to Mine operations initiation and in 2019, when Mine operations commenced. Subsequent surveys will be completed annually as per the TEMMP (Agnico Eagle 2020a).

7.1 Methods

Non-native plant surveys were completed on 23-25 July 2021 by a Golder Biologist. The 2021 survey was focused on the five regulated weeds in Nunavut and monitoring existing non-native plants locations. The five regulated weeds in Nunavut are wild caraway (*Carum carvi*), common dandelion (*Taraxacum officinale*), field sow thistle (*Sonchus arvensis)*, oxeye-daisy (*Leucanthemum vulgare)* and field pennycress (*Thalapsi arvense)*. Non-regulated non-native vascular plants were identified when observed, there are 14 non-native vascular plants identified by the Canadian Endangered Species Conservation Council List (CESCC 2010; Appendix B).

Non-native plant surveys consisted of targeted surveys focused within high-priority or potential areas. The high potential areas were identified as the Project footprint, the accommodations area and the AWAR. Mitigation to control the spread of non-native plants have been applied as described in Section 7.3. The 2022 monitoring surveys will continue to document the presence (if any) and extent of any new non-native species occurrences.

Species were documented as they were encountered within the Project footprint, accommodation area and along the AWAR. Where invasive plant species were observed, a Global Positioning System (GPS) point and photographs taken and the size of occurrence was recorded.

7.2 Results

One non-native plant species was identified during the surveys; common dandelion (*Taraxacum officinale*), listed under the Non-Native and Invasive Species in Nunavut (CESCC 2010; Appendix B). Two occurrences of common dandelion was recorded along the AWAR (Figure 4). Occurrences were hand-pulled, placed in plastic bags, and incinerated. Common dandelion was not observed within the project footprint.

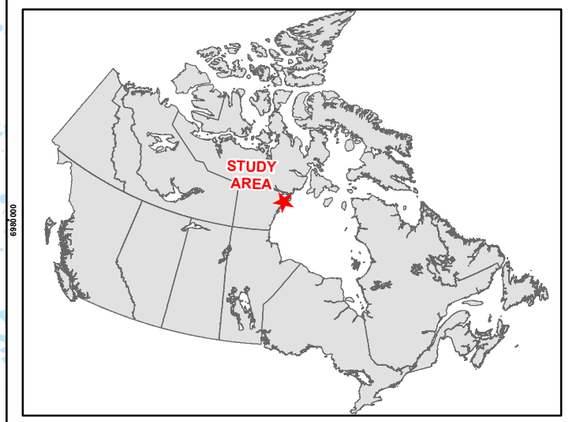
Negligible changes in abundance and distribution of non-native plant species relative to baseline conditions is expected due to the advancement of the Project but controlled through the implementation of mitigation and environmental design features (Volume 6, Section 6.5; Golder 2014). The 2021 results show that non-native and invasive plant species are currently limited to disturbed areas, but prevention and control measures as outlined in the TEMMP (Golder 2020) need to continue to be implemented.

530000
540000
550000
560000
6990000
6980000
6970000

AMAW86
AMAW87
AMAW89
Rankin Inlet
Atulik Lake
Hudson Bay

LEGEND

- DANDELION (TARAOFF)
- SURVEY POINT
- MINE FOOTPRINT (2021)
- ALL-WEATHER ACCESS ROAD (AWAR)
- RANKIN INLET
- WATERCOURSE
- WATERBODY



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2. DATUM: NAD83 PROJECTION UTM ZONE 15

CLIENT
AGNICO EAGLE MINES LIMITED
AGNICO EAGLE

PROJECT
MELIADINE GOLD PROJECT
NUNAVUT

TITLE
2021 INVASIVE PLANT SURVEY LOCATIONS - FLIXWEED

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-04-04
DESIGNED	DM
PREPARED	CDB/MH
REVIEWED	DC
APPROVED	CDM

PROJECT NO.	CONTROL	REV.	FIGURE
20449445	3000/3201	0	4

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7.3 Mitigation

The early detection of non-native invasive plant species is important, as preventing these species from becoming established is the most effective mitigation that can be employed. Invasive plants identified as a concern by the Government of Nunavut Department of Environment (GN DoE) will be reported to the GN, including location of the species (i.e., GPS coordinates and map), species identification and photographs of the species in question.

In addition, due to the early detection of non-native invasive species, the following mitigation measures have been implemented by Agnico Eagle during Project operation, per the TEMMP (Agnico Eagle 2020a):

- Where possible, utilize existing access trails and roads.
- Limit the width of access roads and the size of workspaces.
- Inspect and clean new equipment arriving to site from the ship loading area prior to entering the Project area.
- Complete non-native invasive plant monitoring surveys every year during operations to identify problem areas. Surveys should be targeted for areas with a high potential of occurrence such as along the AWAR, Project footprint, and ship loading areas.

7.4 Accuracy of Impact Predictions

One non-native invasive plant occurrence was observed in disturbed areas (i.e., AWAR). A summary of the effects predictions proposed in the TEMMP (Golder 2020) is provided in Table 6. Specific thresholds for vegetation and wildlife habitat monitoring are outlined in Table 6.

Table 6: Accuracy of Effects Predictions – Vegetation

Monitoring Indicators	Threshold	Exceeded in 2021?	Adaptive Management	Monitoring Method	TEMMP* Section
Habitat Degradation by Contamination	No non-native invasive plant species established	No	See Section 7.5	Non-native invasive Plant Survey of AWAR, and Project site	7.0
Habitat Reclamation following Project Closure	NA	No	Not Currently Identified	Ground Surveys, Vegetation Plots, Mapping	4.0

TEMMP = Terrestrial Environment Management and Monitoring Plan (Agnico Eagle 2020), AWAR = All-weather Access Road.

7.5 Recommendations

For common dandelion occurrences mechanical control such as mowing or hand pulling is recommended, as practicable for the terrain on site.

- If hand pulling with a shovel, the plant material should be collected in bags and disposed of at an offsite location.
- Mowing is a viable option if the following conditions are met: there is access for a mowing unit or hand held trimmer, the terrain is not too steep or hazardous, or if the phenology of the plant stage is not at risk for greater seed dispersal (consult with a vegetation ecologist prior to mowing or trimming).

The CESCC (2010; Appendix B) has developed posters that show non-native species and invasive species in Nunavut. These can continue to be easily displayed at the Project site and incorporated into on-boarding materials. Chemical herbicide treatments are not recommended to be used at this point as the native vegetation/habits in the tundra are very sensitive to impacts.

8.0 BIRDS

Two survey methods were employed in 2021 for monitoring waterfowl, waterbirds, and upland birds: shoreline surveys and point count surveys. Shoreline surveys are designed to determine nesting distribution along shorelines within 200 m of the Project footprint, which is considered to be the approximate zone of influence from sensory disturbance in the FEIS, of mining and Project-related infrastructure (e.g., AWAR). The program will attempt to determine mated pair distribution and nesting success in ponds, wetlands, and lake shorelines within 200 m of Project infrastructure.

Point counts are a method for detecting birds in habitat space (i.e., defined area of 100 m radius plot) during the breeding season. Point count data is used worldwide to estimate spatial distributions, habitat relationships, and population trends of birds.

8.1 Shoreline Surveys

8.1.1 Methods

8.1.1.1 Field Surveys

The shorelines of all waterbodies within 200 m of the Mine and the AWAR were surveyed on foot by Golder Biologists to locate and identify nesting waterbirds. If a waterbody partially intersected the 200 m buffer, only the extent of shoreline that occurred within the buffer was surveyed.

Shorelines were surveyed from 18 June to 6 July 2021 (Figure 5). Approximately 64.1 km of shorelines within 200 m of the Mine and AWAR were surveyed by two observers walking the edge of each waterbody with the intent of flushing any breeding waterfowl or waterbirds nesting on the shore. While completing walking surveys, one observer walked 5 m from the water's edge, while the second observer walked approximately 15 m from the water's edge. The majority of surveys were performed by two Golder Biologists, however a subset of shorelines were surveyed by one Golder Biologist and an Agnico Eagle technician. The majority of nests were re-checked on 5 or 6 July, 2021, with the exception of nests found less than seven days before re-check dates. Survey methods are described in more detail in the TEMMP (Agnico Eagle 2020a). A deviation from the prescribed survey protocol under the TEMMP was required for the 2017 survey period and no nests were recorded that year (Golder 2018). As such, data obtained since 2018 were analyzed for this report.

8.1.1.2 Data Analysis

Data were analyzed to determine nesting activity in ponds, wetlands, and lake shorelines within 200 m of Project infrastructure among survey years. Previous reporting suggested that differences in numbers of nests located among years could be due to differences in observer nest-finding ability, seasonal variation, or time of year effects. Statistical analyses were suggested to isolate observer effects to quantify annual changes in nest abundance, and spatial analysis can be used to identify areas showing the greatest decline in nest abundance (Golder 2021).

Quantifying observer effects may require controlling for other sources of variation, such as time of year effects. Shoreline surveys have varied in timing across years. A summary of nests located by ordinal date (day of year) across years was prepared. However, equal survey effort was not implemented on each day, therefore this summary is only intended to provide preliminary trends on nesting phenology in the LSA. Nests identified beyond 200 m from infrastructure were not included in data summaries.

Shoreline nests were assessed qualitatively in relation to loss of key habitats, and areas where habitat loss occurred. Open water (e.g., lakes and ponds) and wetlands (i.e., birch seep, sedge community, and riparian willow or birch habitats) were considered key waterbird habitats.

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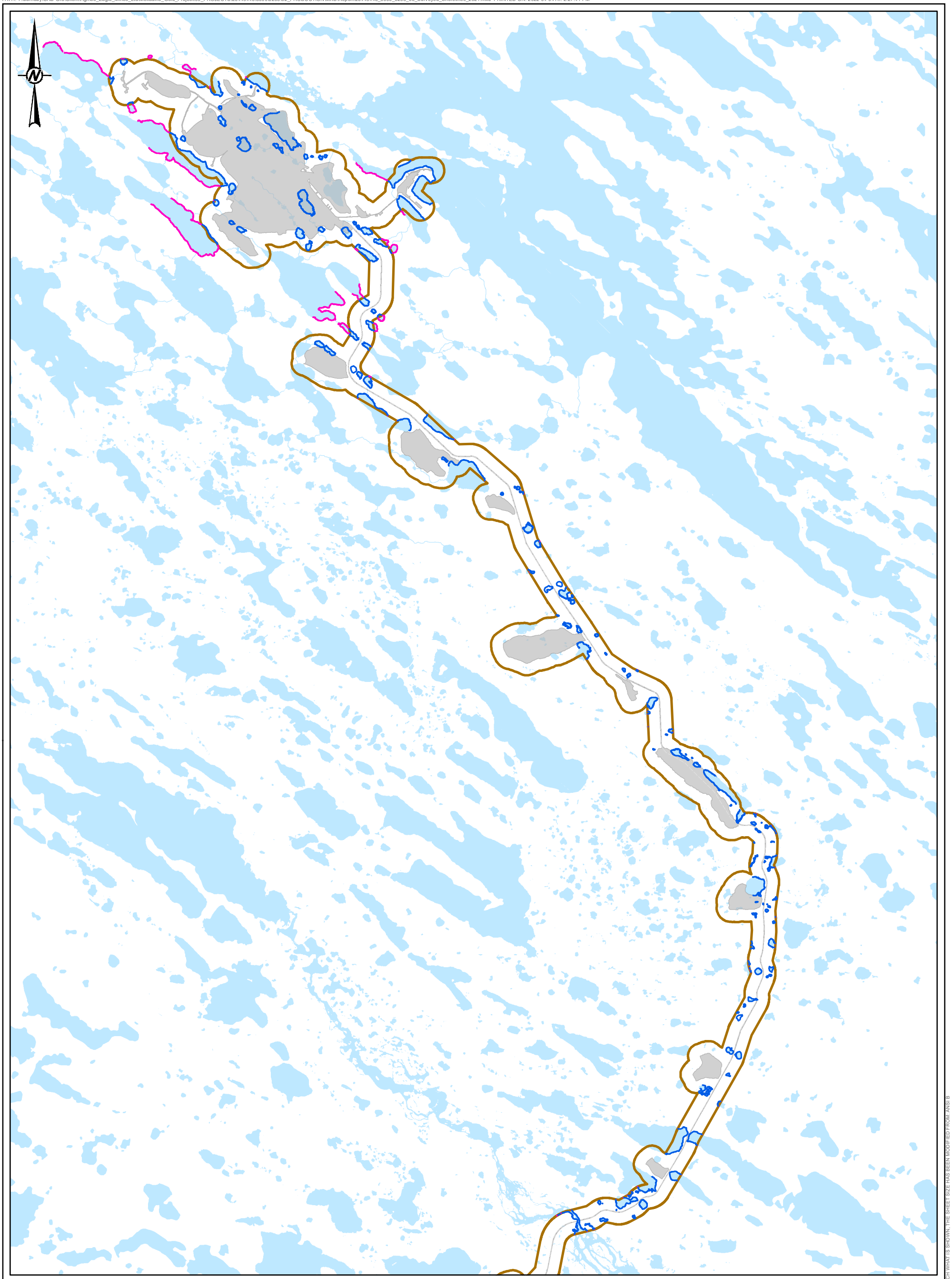

LEGEND

- 2021 SHORELINE SURVEYED
- SHORELINE WITHIN 200 m OF MINE FOOTPRINT (2021)
- 200 m BUFFER OF MINE FOOTPRINT (2021)
- MINE FOOTPRINT (2021)
- ALL-WEATHER ACCESS ROAD (AWAR)
- WATERCOURSE
- WATERBODY

0 1.2 2.4

1:60,000 KILOMETRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED AND NATURAL RESOURCES CANADA.
DATUM: NAD 83 PROJECTION: UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-04-04
DESIGNED	SW
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT

MELIADINE GOLD PROJECT
NUNAVUT

TITLE

SURVEYED SHORELINES WITHIN 200 M OF PROJECT FOOTPRINT (2021)

PROJECT NO.	CONTROL	REV.	FIGURE
20449445	3000/3205	0	5

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8.1.2 Results

At total of 45 nests of 11 species were observed within 200 m of the Mine and AWAR while conducting shoreline surveys in 2021 (Table 7). Two common raven (*Corvus corax*) nests were identified during shoreline surveys, one located on the Mine, and one located on a bridge on the AWAR are not included in this total. Eggs, nestlings and fledglings were observed during surveys; no nest building activity was noted. The number of young was determined for 40 (89%), and 121 young in total were counted (3.0 young per nest on average). Eight nests were beyond 200 m of infrastructure. These nests were of Canada goose (*Branta canadensis*), cackling goose (*Branta hutchinsii*), and herring gull (*Larus argentatus*).

Young counts could not be confirmed for nine nests due to access limitations (e.g., floating island) or apparent risk to nesting birds. Cackling goose was the most commonly observed species with 16 nests recorded and a total of 48 young. Notably more semipalmated plover (*Charadrius semipalmatus*) nests were observed in 2021 compared to previous years. American pipit (*Anthus rubescens*), long-tailed duck (*Clangula hyemalis*), northern pintail (*Anas acuta*), and pacific loon (*Gavia pacifica*) nests were identified for the first time in 2021. Incidental observations of adult red-necked phalarope (*Phalaropus lobatus*; listed as Special Concern under the *Species at Risk Act* [SARA]), king eider (*Somateria spectabilis*), and white-rumped sandpiper (*Calidris fuscicollis*), were made during shoreline surveys.

More nests were observed in 2021 compared to previous years. Greater shoreline length was surveyed in 2021 (64.1 km) than in 2020 (29.6 km). Summary of number of nests located by ordinal day (day of year) indicates large numbers of nests identified early in the season (ordinal day 162 to 167 or June 11 to June 16) and mid-season (ordinal day 178 to 182 or June 27 to July 1) (Figure 7). However, large numbers of nests observed early in the season may be related timing of survey efforts in 2018 and 2019 (Figure 7). Fewer nests observed in 2020 may be related to surveys performed later in the season, compared to other years (Figure 7). Surveys in 2021 were spread over a longer number of days, in the middle of the season compared to other years.

Table 7: Summary of Nests and Eggs Observed during Shoreline Surveys, 2018 to 2021

Common Name	Scientific Name	2018		2019		2020		2021	
		Number of Young[a]	Number of Nests	Number of Young[a]	Number of Nests	Number of Young[a]	Number of Nests	Number of Young[a]	Number of Nests
American Pipit	*Anthus rubescens*	0	0	0	0	0	0	13	2
Cackling Goose	*Branta hutchinsii*	4	3	18	4	6	2	48	16
Canada Goose	*Branta canadensis*	18	16	39	14	14	6	25	6
Cackling/Canada Goose[b]	*Branta* sp.	0	0	0	0	0	0	Unknown[b]	2
Greater White-fronted Goose	*Anser albifrons*	0	0	3	1	0	0	0	0
Herring Gull	*Larus argentatus*	0	0	0	1	0	0	0	0
Horned Lark	*Eremophilia alpestris*	4	1	0	0	3	1	0	0
Lapland Longspur	*Calcarius lapponicus*	2	4	5	1	4	1	9	3
Least Sandpiper	*Calidris minutilla*	0	2	0	0	4	2	16	4
Long-tailed Duck	*Clangula hyemalis*	0	0	0	0	0	0	Unknown[b]	1
Northern Pintail	*Anas acuta*	0	0	0	0	0	0	8	1
Pacific Loon	*Gavia pacifica*	0	0	0	0	0	0	2	1
Peregrine Falcon	*Falco peregrinus*	0	2	0	1	0	0	0	0
Sandhill Crane	*Grus canadensis*	0	0	2	2	0	0	Unknown[b]	1
Savannah Sparrow	*Passerculus sandwichensis*	0	0	0	0	11	2	0	0
Semipalmated Plover	*Charadrius semipalmatus*	0	0	4	1	0	1	32	8
Tundra Swan	*Cygnus columbianus*	2	1	0	0	0	0	0	0
Willow Ptarmigan	*Lagopus lagopus*	0	5	1	1	0	0	0	0
Total		**30**	**34 (20)[c]**	**72**	**26 (20) [c]**	**35**	**15 (13) [c]**	**121**	**45 (40) [c]**

a) Eggs, nestlings, or fledglings were counted to observers' best ability while minimizing disturbance to nests.
b) Used when nest inaccessible (i.e., on island in waterbody) and identification could not be confirmed.
c) Number in parentheses refers to the number of nests for which an egg count could be determined.

535000 540000 545000

6980000 6975000

Meliadine Lake

MEL21N35 2020N13 MEL21N33 N1925 MEL21N20 MEL21N31 2020N21 MEL21N28 N1914 N1915 2020N08 N1911 MEL21N54 2020N11 MEL21N25 2020N10 MEL21N23 MEL21N06 MEL21N08 MEL21N18 N1912 2020N22 N1917 MEL21N16 MEL21N17 N1826 MEL21N02 N1825 MEL21N10 MEL21N15 MEL21N53 N1923 N1913 N1918 MEL21N04 2020N20 2020N01 MEL21N11 MEL21N07 MEL21N09

MEL21N05 MEL21N03 MEL21N01 N1924 2020N09 MEL21N13 N1916 N1813 N1907 MEL21N52 N1926 MEL21N51 N1801 MEL21N44 MEL21N43 MEL21N46 MEL21N42 N1903 N1817 N1818 MEL21N45 MEL21N48 MEL21N49 N1823 MEL21N50 MEL21N22 N1910 N1808 MEL21N37 N1822 MEL21N39 2020N04 N1908 N1821 MEL21N24 MEL21N26 MEL21N47 MEL21N32 N1820 MEL21N55 N1809 N1909 N1810 MEL21N30 N1814 N1904 N1816 N1824 N1815 N1905 N1906 MEL21N41 N1805 N1811 N1807 MEL21N14 MEL21N40 2020N07 N1819 2020N16 MEL21N12 MEL21N36 2020N17 N1804 2020N02 MEL21N38 2020N19 N1902 MEL21N34 N1901 N1802 N1803 MEL21N21 N1827 MEL21N19 N1812 N1806 N1828 MEL21N29 MEL21N27

Meliadine Lake

0 0.8 1.6
1:40,000 KILOMETRES

0 1.2 2.4
1:60,000 KILOMETRES

LEGEND

- BIRD NEST LOCATION (2021)
- BIRD NEST LOCATION (2020)
- BIRD NEST LOCATION (2019)
- BIRD NEST LOCATION (2018)
- 200 m BUFFER OF MINE FOOTPRINT (2021)
- MINE FOOTPRINT (2021)
- ALL-WEATHER ACCESS ROAD (AWAR)
- WATERBODY
- WATERCOURSE

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED AND NATURAL RESOURCES CANADA.
DATUM: NAD 83 PROJECTION: UTM ZONE 15

CLIENT
AGNICO EAGLE MINES LIMITED

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-04-04
DESIGNED	SW
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT
MELIADINE GOLD PROJECT
NUNAVUT

TITLE
LOCATIONS OF BIRD NESTS DETECTED DURING SHORELINE SURVEYS

PROJECT NO.	CONTROL	REV.	FIGURE
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25mm
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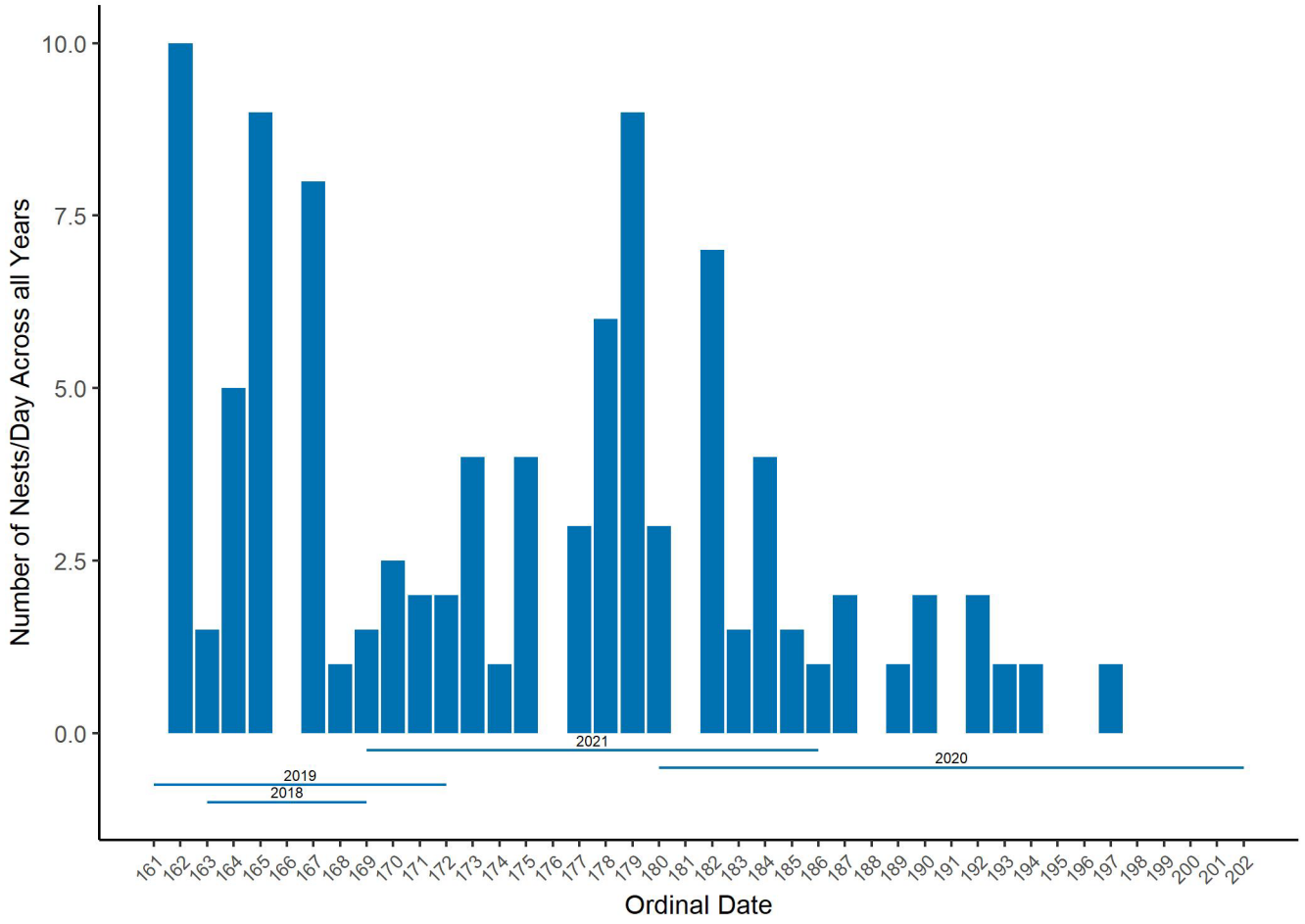

Figure 7: Number of Nests Identified by Day of Year (2018 to 2021). Line Segments Indicate Survey Dates in each Year

A total of 55 ha of key habitats for waterbirds have been disturbed between 2018 and 2021 (Table 5). The majority of this loss was sedge community (42 ha), followed by water (12 ha), birch seep (1 ha), and riparian willow or birch (<1 ha; Table 5). Habitat loss has occurred along the southern edge of the Mine site since 2018 (Figure 3). Despite these changes, a relatively large number of nests were found in 2021 along the southwest and southern edges of the mine site (Figure 3; Figure 6).

8.2 Point Counts

Upland bird plots, or point counts, were distributed along transects on either side of the AWAR. The objective of the point count surveys was to estimate the effects of increased traffic along the AWAR on the density, species richness, and distribution of upland breeding birds along the AWAR and how these effects might diminish with increasing distance from the road (Agnico Eagle 2020a). In future years, trend analysis can be conducted to measure how these responses change with varying traffic levels on the AWAR.

8.2.1 Methods

8.2.1.1 Field Surveys

A total of 72 point count plots were surveyed in 2021 (between 21 June and 28 June 2021). Point count plots were located within 1 kilometre (km) on either side of the AWAR (2 km in total) with the first point count occurring at 50 m from the road edge and each subsequent plot spaced 100 m from the center of the preceding plot (Figure 8). Habitat was determined from Ecological Landscape Classification (ELC) data. Surveys did not target specific habitats (i.e., surveys were selected based on distance from road, rather than habitat), but generally reflect distribution of habitat types in the LSA (Table 8). Three plots (1-2, 1-13, and 4-1; Figure 8) were moved slightly in 2021 due to proximity to infrastructure or overlap with waterbodies. Point counts were 5 minutes in duration and all species detected by sight or sound within 50 m and between 50 to 100 m of the observer were recorded; observations beyond 100 m were recorded as incidentals. The survey method is described in more detail in the TEMMP (Agnico Eagle 2020a). The recommendation to standardize distance estimation across observers was made in the 2020 TEMMP report (Golder 2021). Observers in 2021 calibrated estimation between observers at selected point count locations in 2021.

Table 8: Distribution of Habitat Types in the LSA.

Habitat Type	Percent of LSA (%)	Number of Point Count Plots in 2021[(a)]
Birch Seep	4.66	3 (4.17%)
Heath Tundra Community	46.20	33 (45.83%)
Lichen-Heath (Cetraria Lichen)	3.25	6 (8.33%)
Lichen-Heath (Hair Lichen)	1.61	6 (8.33%)
Lichen-Rock Community[(b)]	2.46	5 (6.94%)
Sedge Community	19.01	19 (26.39%)
Water	22.80	0 (0%)

a) Percent of plots presented in brackets.
b) Values based on Ecological Landscape Classification data; habitat of one plot outside LSA inferred from field habitat calls.

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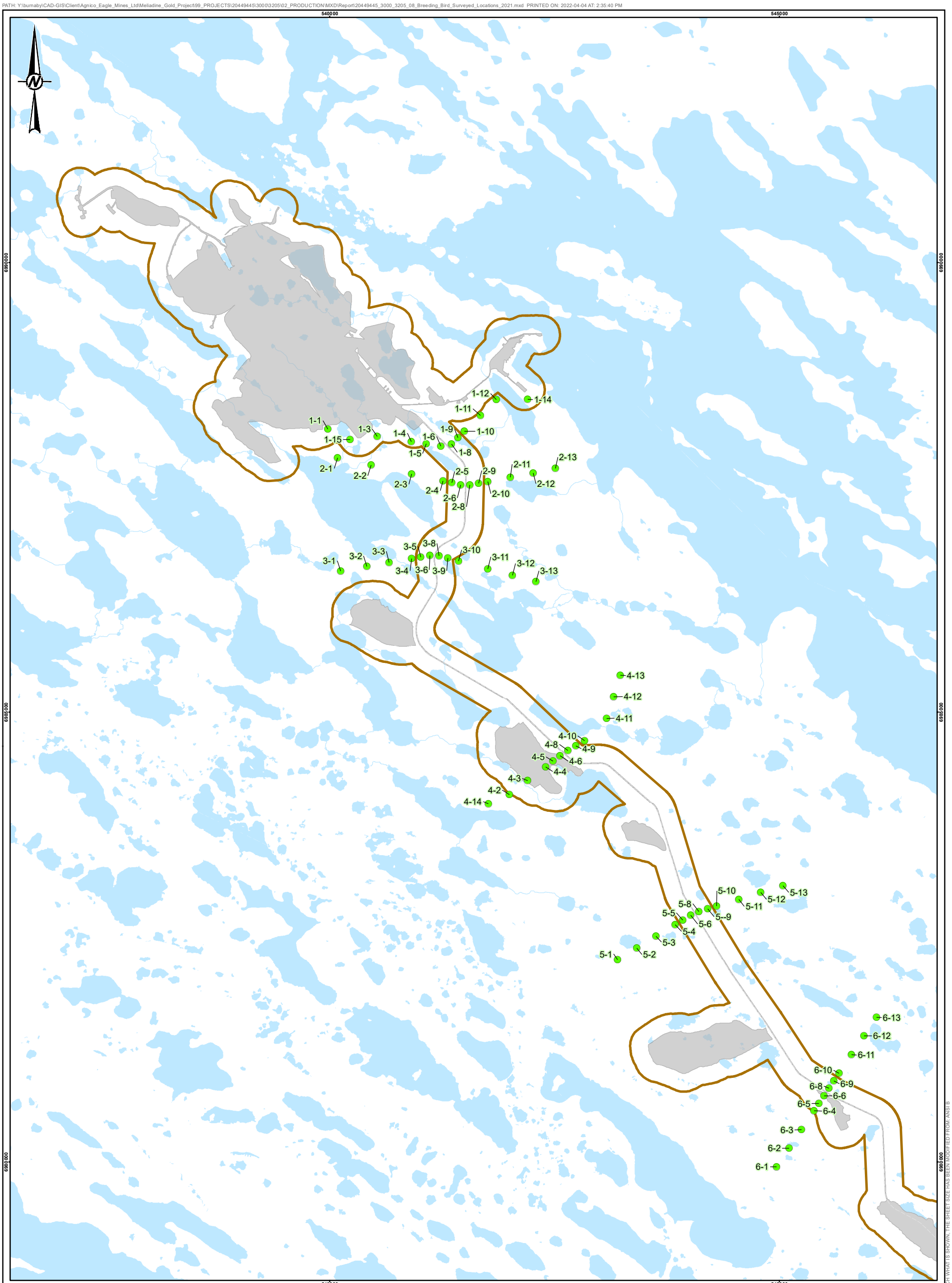

LEGEND

- BREEDING BIRD SURVEY
- 200 m BUFFER OF MINE FOOTPRINT (2021)
- MINE FOOTPRINT (2021)
- ALL-WEATHER ACCESS ROAD (AWAR)
- WATERBODY
- WATERCOURSE

0 0.8 1.6

1:40,000 KILOMETRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED AND NATURAL RESOURCES CANADA.
DATUM: NAD 83 PROJECTION: UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-04-04
DESIGNED	SW
PREPARED	CDB
REVIEWED	DC
APPROVED	CDM

PROJECT

MELIADINE GOLD PROJECT
NUNAVUT

TITLE

BREEDING BIRD SURVEY LOCATIONS ALONG THE AWAR (2021)

PROJECT NO.	CONTROL	REV.	FIGURE
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8.2.2 Data Analysis

8.2.2.1.1 Individual Species Analysis

A species-level analysis calculated the mean density of individual passerine species detected during point count surveys among each habitat type in 2021. Density was calculated as the number of individuals of each species per hectare detected at each point count, averaged across point counts within each habitat type. For example, a point count circle is a 100 m radius circle, or 3.14 ha, so a single individual detected at a point count would have a density of 0.32 birds/ha (1 bird/3.14 ha). Changes in the average density of each species within habitat types from 2018 to 2021 were calculated to illustrate measured differences between the survey years (Table 9).

8.2.2.1.2 Community Analysis

A community-level analysis examined the total density, species richness, and an index of species diversity of all passerine species measured in each habitat type for each year. Density was calculated as the number of individuals per hectare (summed across species) detected at each point count, averaged across point counts within each habitat type. Species richness was calculated as alpha richness, or a count of the number of species detected at a point count. Diversity was calculated as the Shannon's H-index using the 'vegan' package in R (Oksanen et al. 2019).

For each metric (density, richness, and diversity), a two-way analysis of variance (ANOVA) was calculated in R version 4.1.2 (R Core Team 2021) to determine if habitat type or year were significant predictors of variation.

8.2.2.1.3 Generalized Linear Models

Generalized linear models (GLMs) assuming a normal distribution were estimated to test for the effects of categorical year ('Year'), habitat type ('Habitat'), distance of the point count from the AWAR ('Distance'), and ordinal day of year ('Date') on the density of passerines detected at each point count. A random effect for observer was included in models to account for variation in estimation of bird densities among observers, based on recommendations in the 2020 TEMMP report (Golder 2021). The recommendation to test the influence of traffic on breeding bird density was suggested in the 2020 TEMMP report (Golder 2021). However, traffic data linked to individual point counts was not collected in the field. Differences in traffic data are expected to be correlated with Year, which was a variable included in models. Akaike's Information Criterion (AIC) was used to assess the best fit among all candidate models, and all models within ΔAIC of 2.0 of the top model were considered equally viable models. 'Distance' and 'Date' were normalized between 0 and 1 prior to use in models, rather than using raw meters or ordinal date. A value of 0 would represent the minimum value sampled (i.e., 50 m from the AWAR) and a value of 1 would represent the maximum value sampled (i.e., 1000 m from the AWAR).

8.2.3 Results

8.2.3.1 Individual Species Results

Six passerine species were detected during point count surveys in 2021 (Table 9). An additional 22 bird species were incidentally recorded in all years during the point count surveys, including shorebirds, waterbirds, raptors, and upland breeding birds outside of 100 m from observers (Appendix C). No upland breeding bird species at risk (Government of Canada 2022) have been recorded during upland breeding bird surveys in any survey year.

Horned larks (*Eremophilia alpestris*) were recorded in all habitats in 2021, with the highest density recorded in Lichen-Heath (*Cetraria* Lichen) habitat (Table 9). Lapland longspur (*Calcarius lapponicus*) densities were highest in Birch Seep, however only three plots were performed in this habitat (Table 9). Savannah sparrow (*Passerculus sandwichensis*) densities were highest in Birch Seep, and Lichen-Heath (*Cetraria* Lichen) habitats (Table 9).

White-crowned sparrow (*Zonotrichia leucophrys*) and American pipit (*Anthus rubescens*) densities were highest in Lichen-Rock Community habitat (Table 9). American robin (*Turdus migratorius*) was not detected in 2021. Low densities of common redpoll (*Acanthis flammea*) were observed in Heath Tundra Community, Lichen-Heath (Hair Lichen), and Sedge Community habitats (Table 9).

Overall, density of each species only varied slightly among years. Compared to previous years, fewer American pipits and more horned larks were observed in 2021 (Figure 9). A downward trend in American pipit density has been observed since 2019 (Figure 9). Across years, overall density of American robin, common redpoll, and white-crowned sparrows were less than 0.1 birds/ha (Figure 9).

Table 9: Mean (± 1SE) Density (Individuals per Hectare) of Passerine Bird Species among Habitats along the AWAR in 2021.

Common Name	Scientific Name	Habitat Type					
		Birch Seep	Heath Tundra Community	Lichen-Heath (*Cetraria* Lichen)	Lichen-Heath (Hair Lichen)	Lichen-Rock Community	Sedge Community
American Pipit	*Anthus rubescens*	0.00 + 0.00	0.03 + 0.02	0.00 + 0.00	0.00 + 0.00	0.06 + 0.06	0.03 + 0.02
American Robin	*Turdus migratorius*	0.00 + 0.00	0.00 + 0.00	0.00 + 0.00	0.00 + 0.00	0.00 + 0.00	0.00 + 0.00
Common Redpoll	*Acanthis flammea*	0.00 + 0.00	0.01 + 0.01	0.00 + 0.00	0.05 + 0.05	0.00 + 0.00	0.03 + 0.02
Horned Lark	*Eremophilia alpestris*	0.21 + 0.11	0.43 + 0.07	0.48 + 0.14	0.64 + 0.14	0.51 + 0.08	0.37 + 0.07
Lapland Longspur	*Calcarius lapponicus*	0.32 + 0.32	0.28 + 0.06	0.16 + 0.11	0.05 + 0.05	0.00 + 0.00	0.24 + 0.07
Savannah Sparrow	*Passerculus sandwichensis*	0.21 + 0.11	0.11 + 0.04	0.21 + 0.07	0.11 + 0.11	0.00 + 0.00	0.19 + 0.05
White-crowned Sparrow	*Zonotrichia leucophrys*	0.00 + 0.00	0.01 + 0.01	0.05 + 0.05	0.00 + 0.00	0.19 + 0.08	0.02 + 0.02

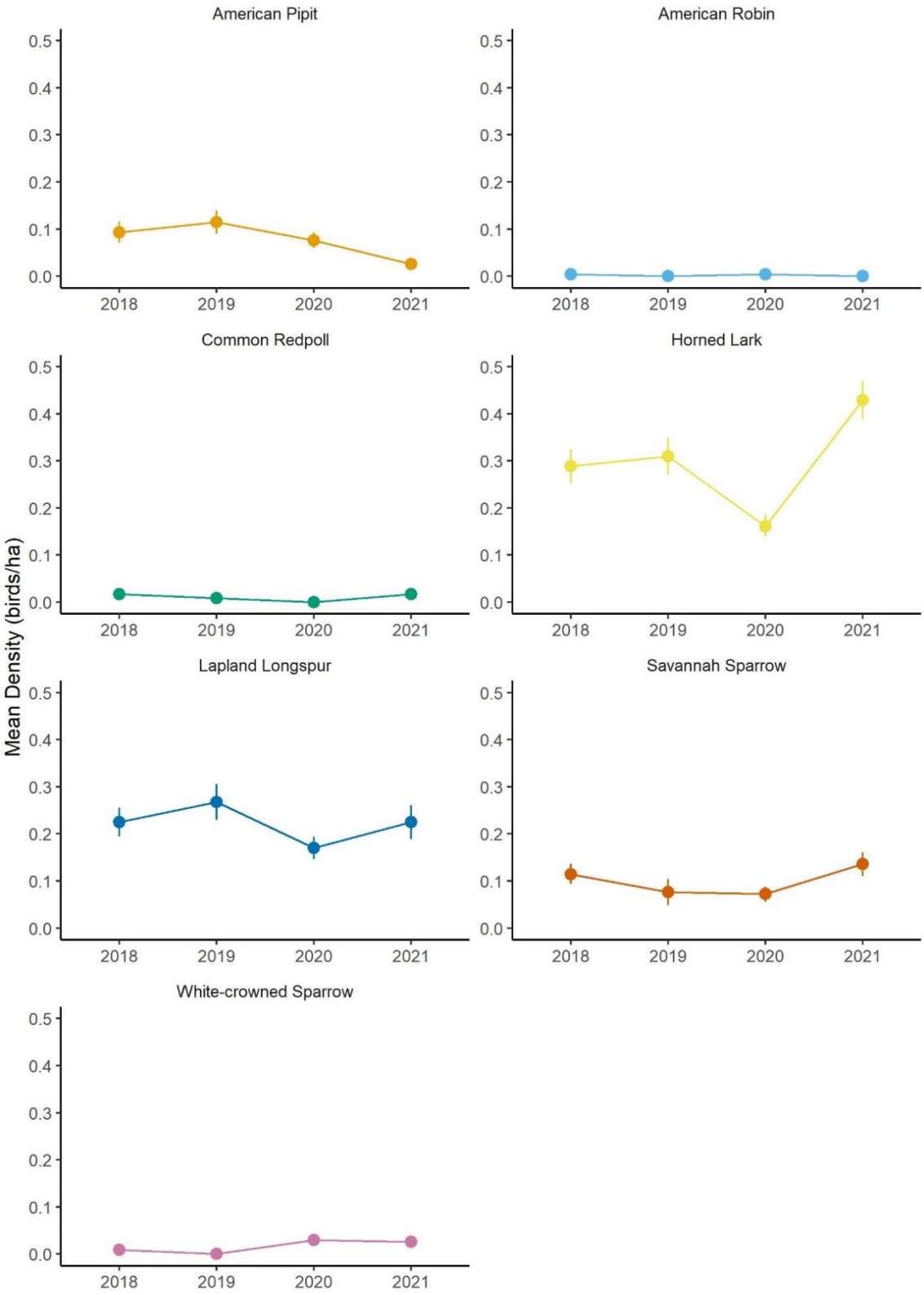


Figure 9: Mean Densities (± 1SE) of Passerine Species Across Years

8.2.3.2 Community Results

Total passerine density at the point count level ranged from 0.32 to 1.91 birds per hectare (ha) in 2021. Heath Tundra Community, Lichen-Heath (*Cetraria* Lichen), and Sedge Community had similarly high bird densities (Table 10). Lowest densities were observed at Birch Seep and Lichen-Rock Community habitats (Table 10).

The total mean density of birds was highest in 2021 compared to other survey years with 0.90 ± 0.05 birds/ha. The mean density (± 1SE) of passerine birds at the point count level was not significantly different among habitat types ($F_{5,279}$=0.84, P=0.52), but varied among year ($F_{3,279}$=7.91, P<0.01; Figure 10). A Tukey's test for pairwise comparisons showed that 2020 had significantly lower density than 2018 (P=0.01), 2019 (P<0.01), and 2021 (P<0.01).

Table 10: Passerine Bird Densities by Habitat Type from 2018 to 2021.

Habitat	2018		2019		2020		2021	
	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE
Birch Seep	2	0.80 ± 0.48	2	0.64 ± 0.00	2	0.16 ± 0.16	3	0.74 ± 0.28
Heath Tundra Community	34	0.80 ± 0.06	34	0.89 ± 0.09	34	0.42 ± 0.06	33	0.93 ± 0.08
Lichen-Heath (*Cetraria* Lichen)	6	1.06 ± 0.26	6	0.80 ± 0.18	6	0.80 ± 0.16	6	0.90 ± 0.17
Lichen-Heath (Hair Lichen)	6	0.74 ± 0.27	6	0.69 ± 0.21	6	0.80 ± 0.16	6	0.85 ± 0.20
Lichen-Rock Community	5	0.64 ± 0.17	5	0.38 ± 0.19	5	0.83 ± 0.13	5	0.76 ± 0.08
Sedge Community	19	0.72 ± 0.09	19	0.85 ± 0.14	19	0.59 ± 0.09	19	0.92 ± 0.11

SE = standard error

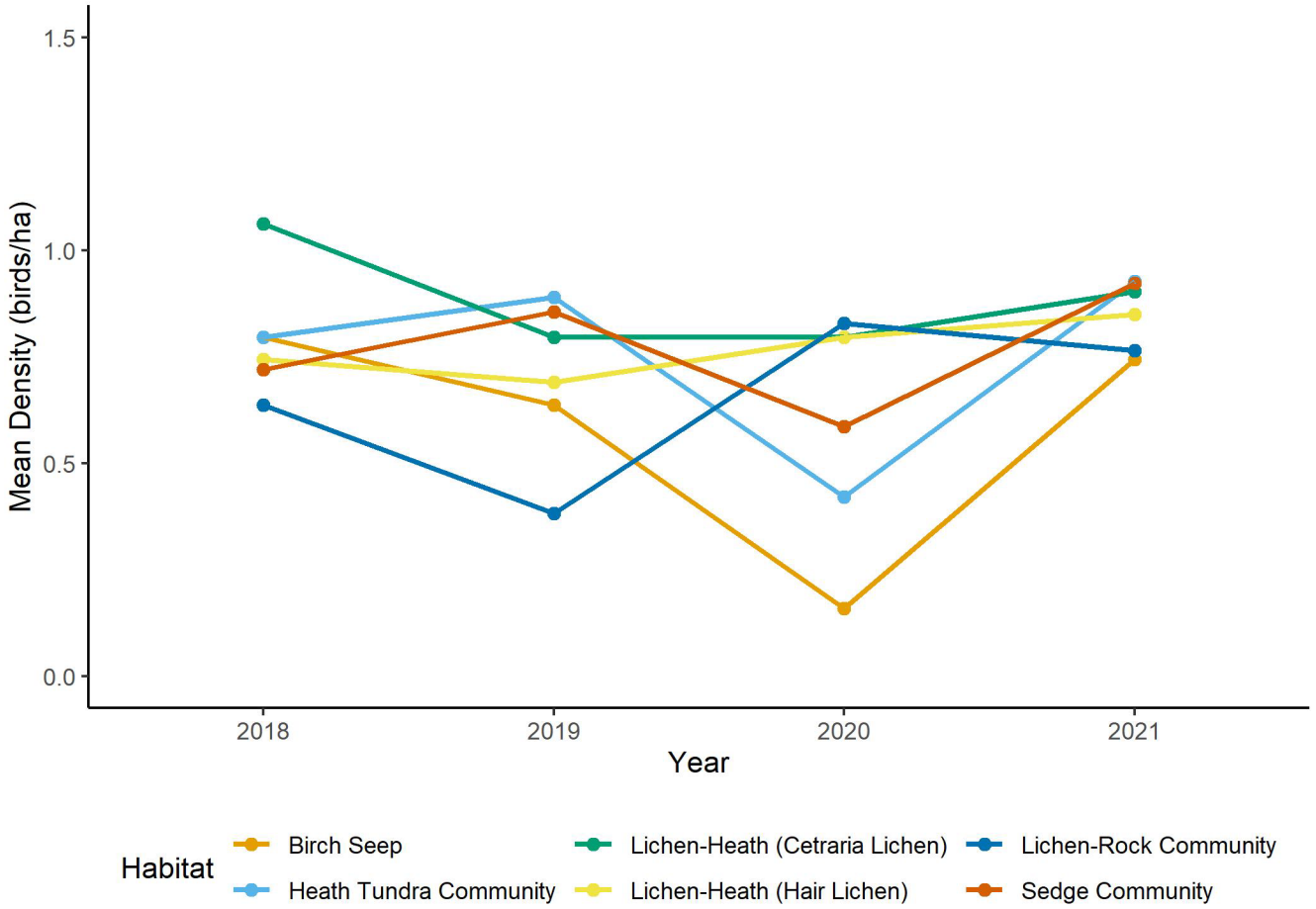


Figure 10: Plot of Avian Density Across Years and Habitat Types. Error Bars not Shown for Clarity.

Species richness at the point count level varied from one to four species detected in 2021. Lichen-Heath (Cetraria Lichen) habitat (2.00 + 0.26 species per plot) and Sedge Community (2.05 + 0.19 species per plot) habitats had the highest mean richness in 2021 (Table 11). Mean species richness was highest in 2021 compared to other survey years with 1.81 ± 0.09 species per plot. A two-way ANOVA showed that species richness was not different among habitat types ($F_{5,279}$=1.06, P=0.38) or among years ($F_{3,279}$=1.91, P=0.13; Figure 11).

Table 11: Mean Species Richness of Passerine Birds across Habitat Types along the AWAR, 2018 to 2021.

Habitat	2018		2019		2020		2021	
	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE
Birch Seep	2	2.00 ± 1.00	2	1.00 ± 0.00	2	0.50 ± 0.50	3	1.67 ± 0.33
Heath Tundra Community	34	1.82 ± 0.13	34	1.68 ± 0.14	34	1.24 ± 0.16	33	1.70 ± 0.13
Lichen-Heath (Cetraria Lichen)	6	2.00 ± 0.52	6	1.50 ± 0.22	6	1.83 ± 0.17	6	2.00 ± 0.26
Lichen-Heath (Hair Lichen)	6	1.83 ± 0.48	6	1.33 ± 0.21	6	2.33 ± 0.56	6	1.50 ± 0.34
Lichen-Rock Community	5	1.20 ± 0.37	5	0.80 ± 0.37	5	2.00 ± 0.45	5	1.80 ± 0.20
Sedge Community	19	1.63 ± 0.16	19	1.68 ± 0.17	19	1.68 ± 0.24	19	2.05 ± 0.19

SE = standard error

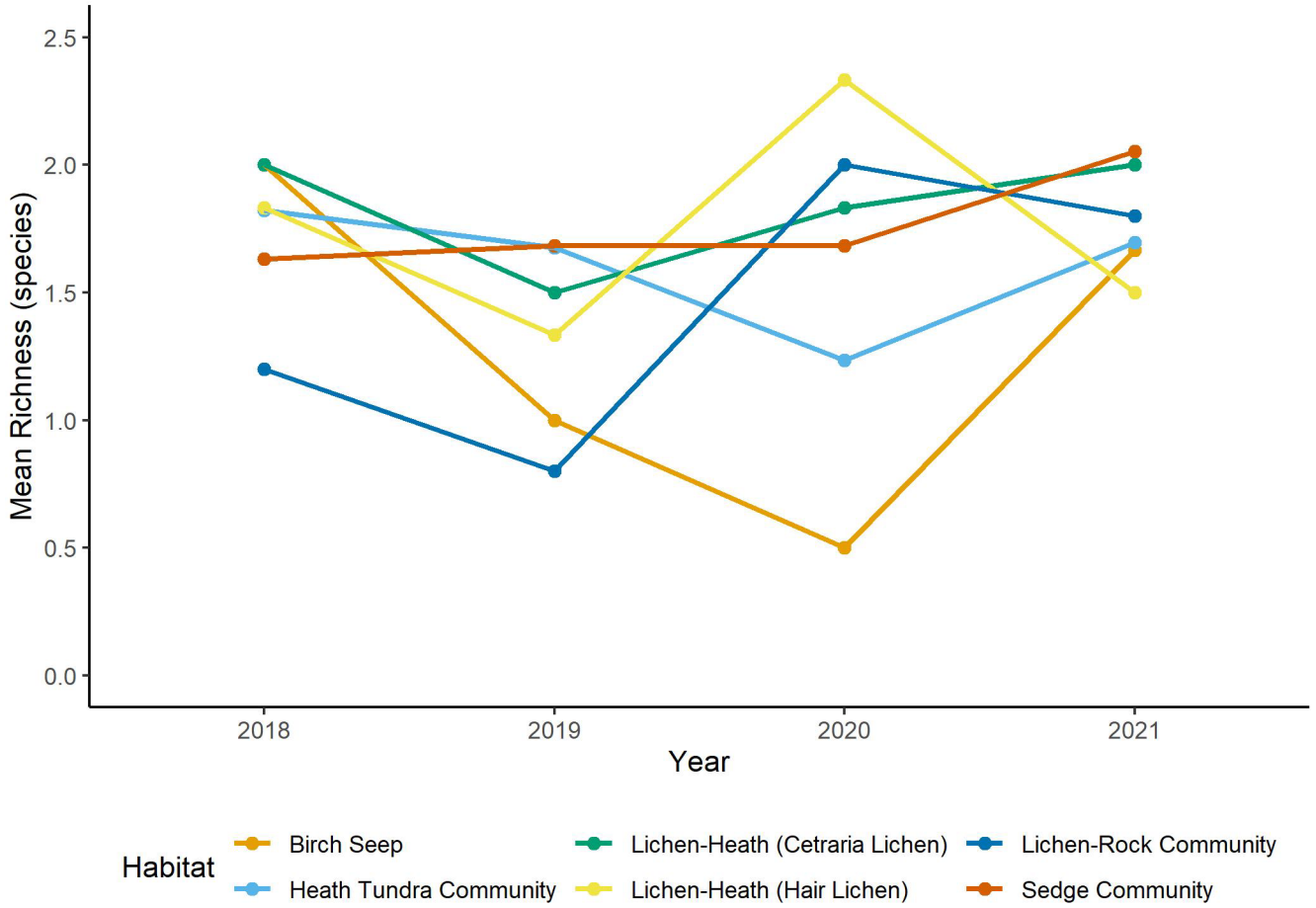


Figure 11: Plot of Avian Richness Across Years and Habitat Types. Error Bars not Shown for Clarity.

Species diversity at the point count level varied from 0 to 1.33 in 2021, 0 to 1.39 in 2020, 0 to 1.05 in 2019, and 0 to 1.10 in 2018. Mean diversity was highest in Sedge Community and Lichen-Heath (Cetraria Lichen) in 2021 (Table 12). Lowest species diversity was recorded in Lichen-Heath (Hair Lichen). A two-way ANOVA showed that differences in species diversity were not significant among habitat types ($F_{5,279}$=0.92, P=0.47) nor between years ($F_{3,279}$=0.84, P=0.48; Figure 12).

Table 12: Species Diversity of Passerine Birds among Habitats along the AWAR, 2018 to 2021.

Habitat	2018		2019		2020		2021	
	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE
Birch Seep	2	0.52 ± 0.52	2	0.00 ± 0.00	2	0.00 ± 0.00	3	0.42 ± 0.21
Heath Tundra Community	34	0.48 ± 0.07	34	0.44 ± 0.06	34	0.29 ± 0.07	33	0.41 ± 0.07
Lichen-Heath (Cetraria Lichen)	6	0.62 ± 0.21	6	0.33 ± 0.15	6	0.56 ± 0.11	6	0.59 ± 0.13
Lichen-Heath (Hair Lichen)	6	0.58 ± 0.20	6	0.23 ± 0.14	6	0.69 ± 0.25	6	0.29 ± 0.19
Lichen-Rock Community	5	0.27 ± 0.16	5	0.13 ± 0.13	5	0.58 ± 0.25	5	0.53 ± 0.13
Sedge Community	19	0.38 ± 0.09	19	0.45 ± 0.09	19	0.46 ± 0.11	19	0.60 ± 0.09

SE = standard error
a) Species diversity is measured using the Shannon diversity index.

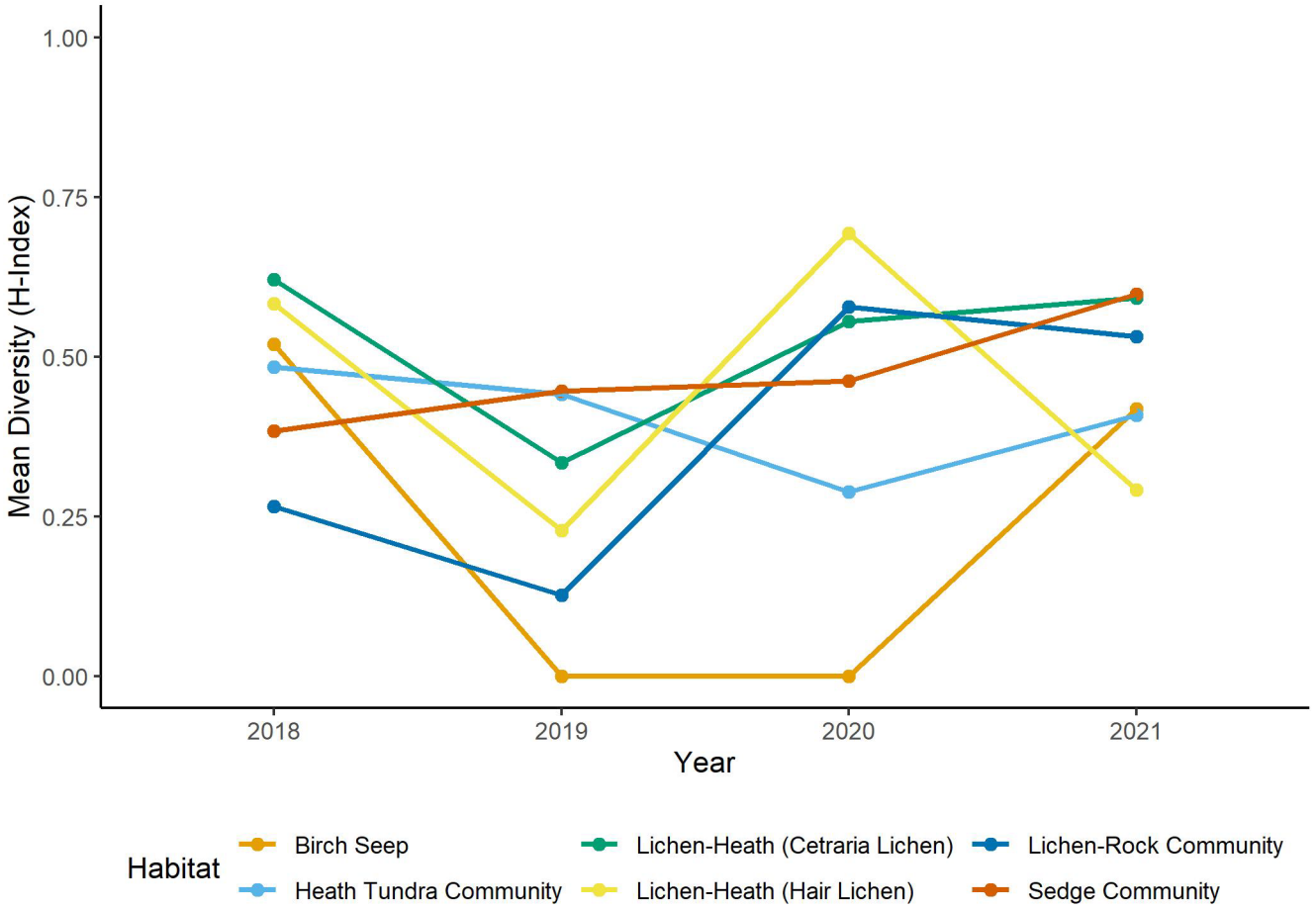


Figure 12: Plot of Avian Diversity Across Years and Habitat Types. Error Bars not Shown for Clarity.

Overall, these results indicate that only density was lower in 2020 compared to other survey years. Species richness and diversity have not changed from 2018 to 2021 along the AWAR. Differences in density in 2020 may be explained by survey timing later in the season than in other years (Figure 13). High values for richness, diversity, and density suggest that surveys were well timed in 2021.

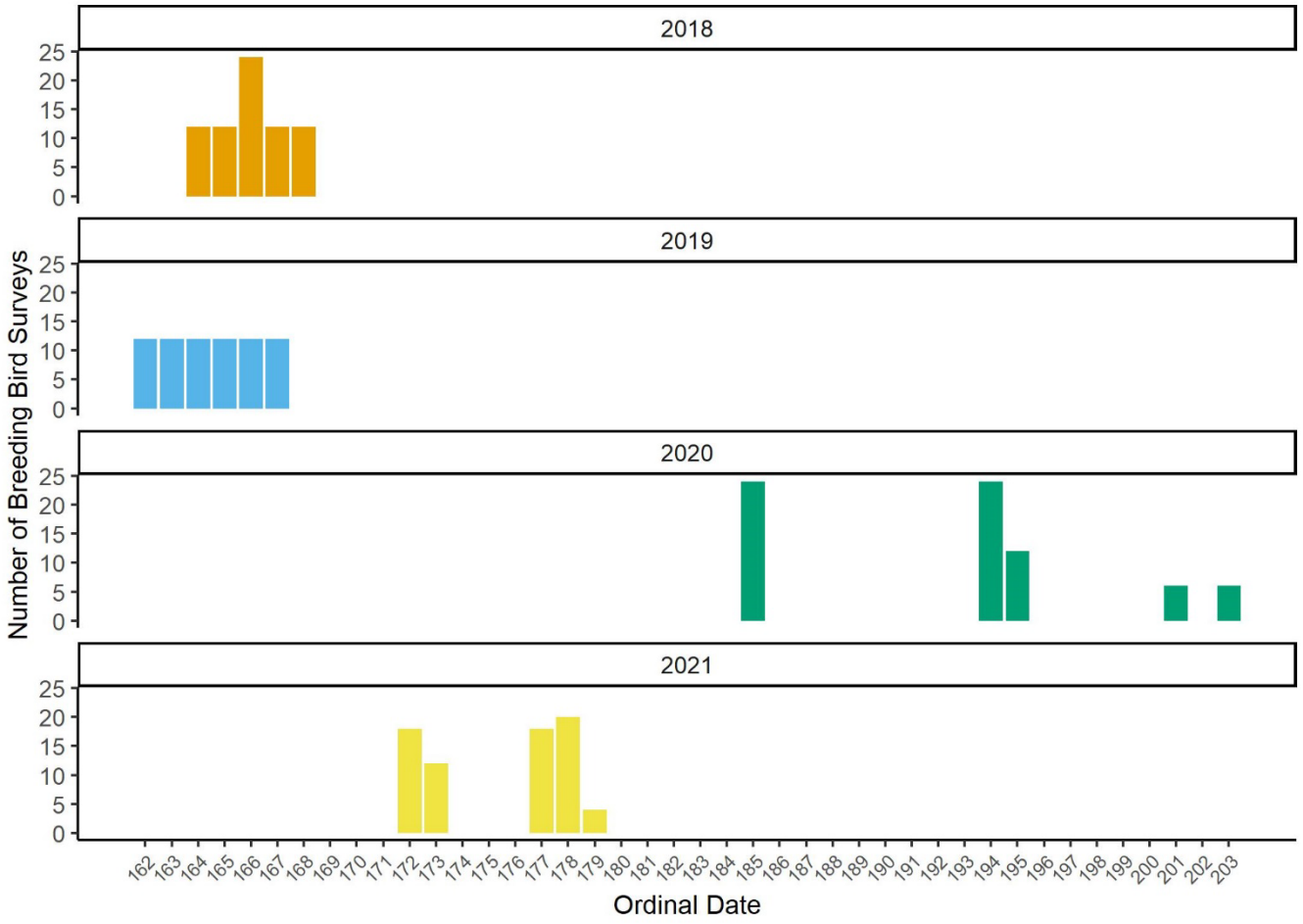


Figure 13: Number of Points Counts by Ordinal Day across Years.

8.2.3.3 Generalized Linear Model Results

The top model for explaining variation in species density was the Ordinal Date model, which included a random effect for observer (Table 13). The intercept in the model estimated the null expected density of a point count to be approximately 0.92 birds per hectare (Table 14). Ordinal Date had a negative effect on density (β=-0.41 , SE=0.12), indicating that bird density was highest earlier in the season, and lowest later in the season (Table 14; Figure 14). Year was not included in the top model, suggesting that survey timing may have influenced lower bird densities seen in 2020.

The top model in the 2020 analysis included year and distance (Golder 2021). One explanation for increasing bird densities with distance from the AWAR could be presence of more preferred habitats away from the AWAR. A model that included an interaction between habitat and distance was tested to determine if bird species density is conditional on where habitat is located relative to the road. However, this model was not competitive (Table 13).

Table 13: Akaike's Information Criterion Ranking for Candidate Generalized Linear Models for Passerine Density, 2018 to 2021

Model Structure	AIC	ΔAIC
Date	361.60	0.00
Year + Date	364.45	2.86
Year	366.86	5.26
null	367.79	6.19
Year + Distance	372.37	10.77
Distance	373.20	11.61
Date + Habitat	381.34	19.75
Year + Habitat	387.64	26.04
Habitat	387.75	26.15
Habitat * Distance	392.64	31.05
Habitat + Distance	392.95	31.35

a) Akaike's Information Criterion.
b) Change in AIC between the given model and the top model. Top model sets are determined using a threshold of ΔAIC less than 2.

Table 14: Coefficients and Standard Error of Top Generalized Linear Model for Passerine Density

Variable	Coefficient	Standard Error
Intercept	0.92	0.08
Date	-0.41	0.12

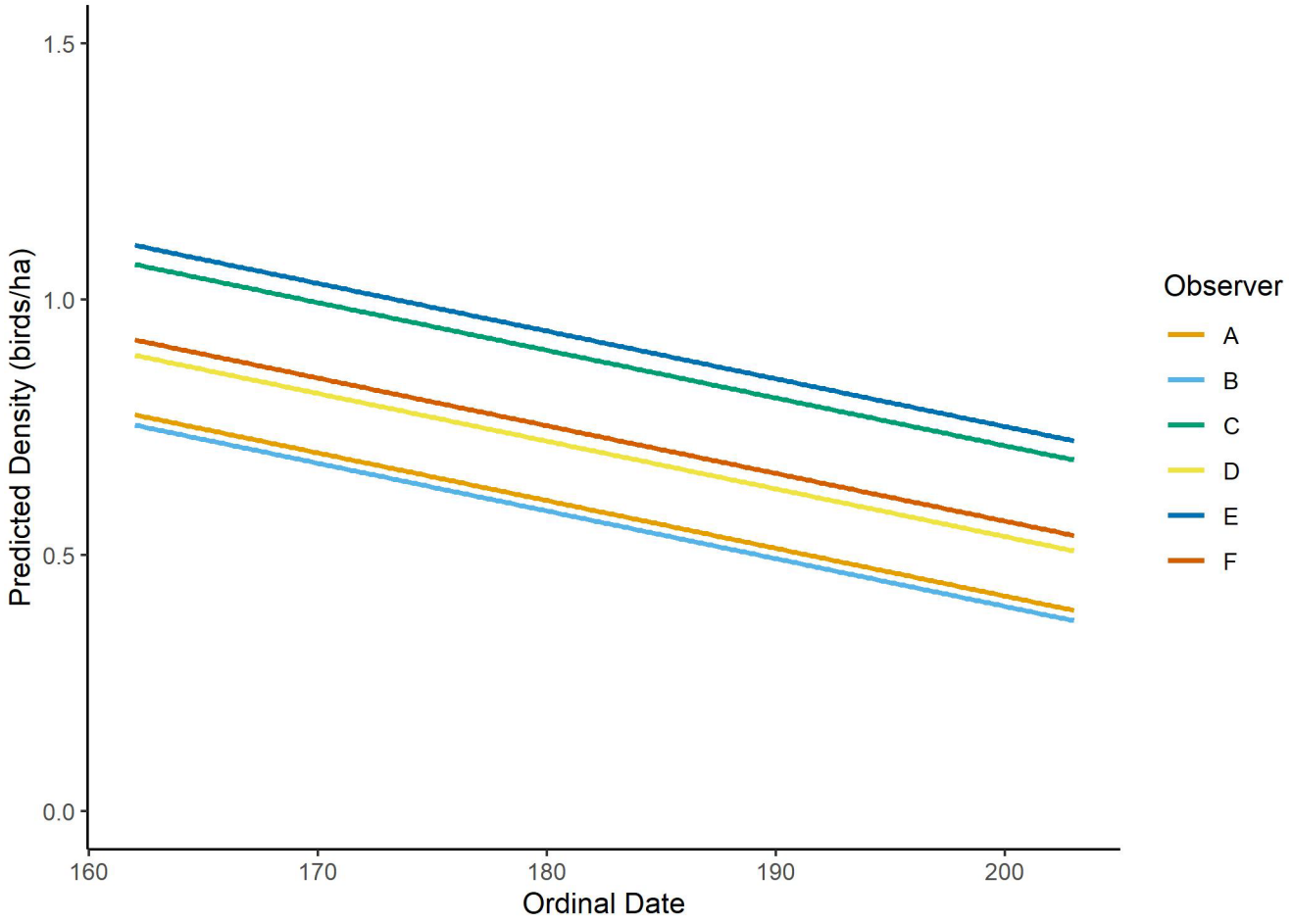


Figure 14: Predictions from Top GLM Model of Passerine Densities at Point Counts in Response to Ordinal Date. Error Bars not Shown for Clarity.

8.3 PRISM

The Program for Regional and International Shorebird Monitoring (PRISM) is a standardized method for monitoring shorebirds. PRISM surveys are designed to document population numbers of Arctic breeding shorebirds, describe the distribution and habitat associations of shorebirds, and monitor trends in population size (Bart et al. 2005). The PRISM surveys conducted as part of monitoring for the Project will contribute to regional knowledge in an effort to set population targets and assist with management and conservation of these species (EC 2012). All PRISM data will be submitted to ECCC for inclusion in their regional database.

PRISM surveys were not conducted in 2021 because this monitoring was completed in 2018 and 2019. As per recommendations from ECCC, Agnico Eagle has committed to completing PRISM surveys over 2 years, every 5 years (Agnico Eagle 2020a). The next two monitoring years are scheduled to occur in 2023 and 2024.

8.4 Recommendations

Surveyors should continue to calibrate distance estimation for point count surveys. Results highlight importance of survey timing. However, timing of peak breeding bird activity is expected to vary between years.

Results indicate that survey timing influence breeding bird densities and the number of shoreline nests located. A subset of shorelines could be surveyed twice, potentially as part of nest re-checks, to identify potential observer effects on nest detection. Alternatively, pre-determined transects in areas where nests have previously been located could be established, to allow accurate comparison of effort across years, nest-finding ability, and changes in nest density related to different locations. A subset of these transects in 2022 could be surveyed multiple times by separate observers to quantify observer effects in nest detectability.

9.0 WILDLIFE OBSERVATIONS

Agnico Eagle's Environmental Technicians conduct site surveillance monitoring and road surveillance monitoring regularly of the AWAR and the Project. In addition to planned surveys, all supervisors ask their employees to report wildlife sightings; Wildlife logs are posted throughout the Mine site and easily accessible to employees to facilitate wildlife reporting before, during, and after work shifts.

In previous years, observations from of wildlife surveys and wildlife incidental observations were pooled and compared with previous years. Results are presented separately to distinguish between results of formal wildlife surveys, and incidental observations in 2021. However, combined survey observations and incidentals in 2021 were comparable to other years (2018=7,198 individuals; 2019=880 individuals; 2020=2,650 individuals; 2021=4,098 individuals; Golder 2021). Figure 15 includes wildlife observations between 2018 and 2021 from both incidental observations, and wildlife surveys.

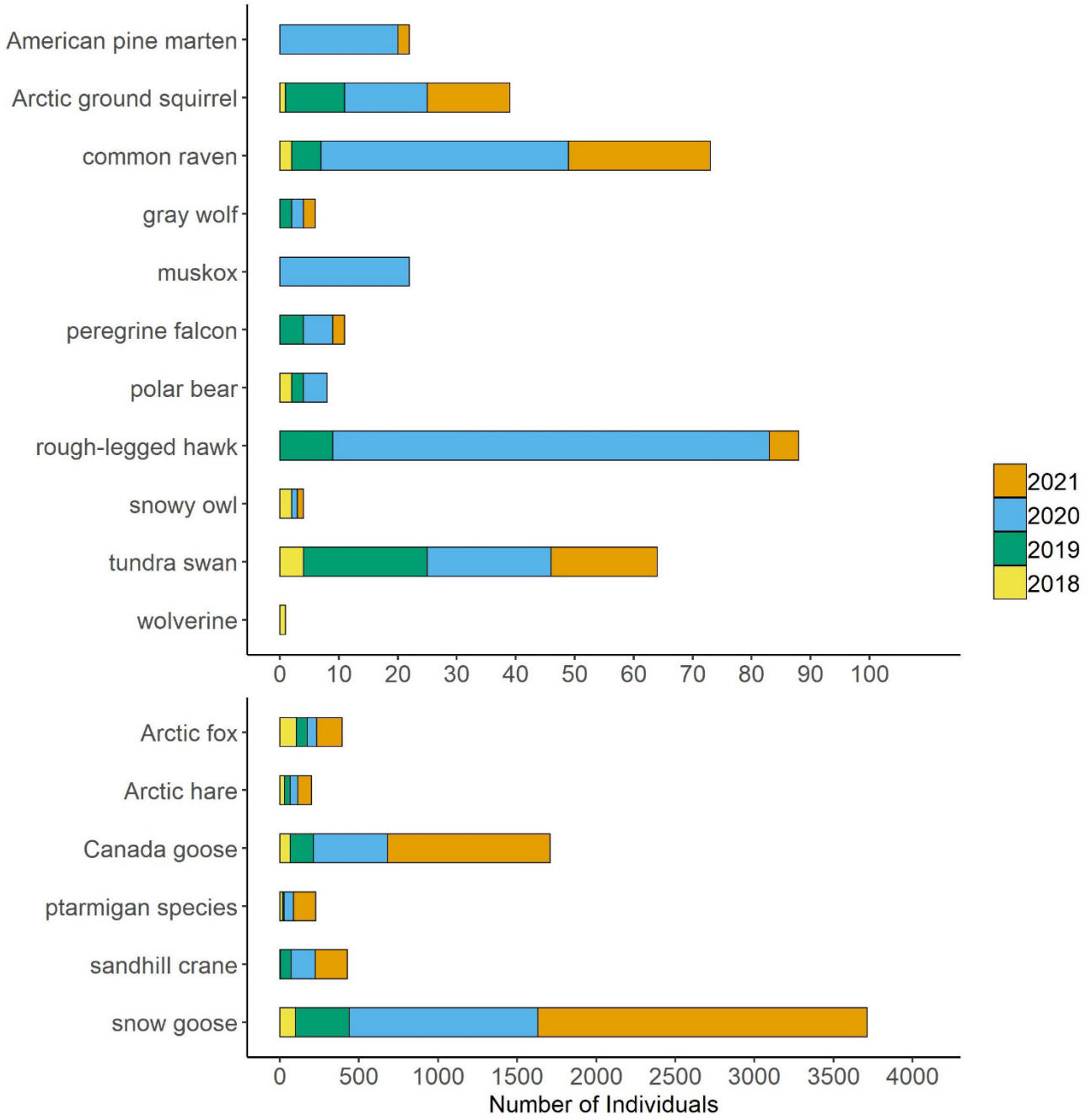


Figure 15: Wildlife Observations, 2018 to 2021. Note Different Scales Used Based on Frequency of Observation.

9.1 Wildlife Surveys

Wildlife sighting/track surveys were completed by Agnico Eagle personnel along the AWAR an average of every 6.3 days from 13 January 2021 to 29 December 2021. In addition, wildlife sighting/track surveys were completed at Mine infrastructure (e.g., land farms, tank farms, camps, construction areas, exploration areas, the incinerator, water management ponds) an average of every 13.1 days from 6 January 2021 to 27 December 2021 (Table 15).

Table 15: Details of Wildlife Surveys in 2021

Month	Number of All Weather Access Road Surveys	Number of Mine Site Surveys
January	2	4
February	2	2
March	4	1
April	5	1
May	8	4
June[(a)]	7	3
July[(a)]	1	1
August	1	2
September	5	1
October	6	2
November	5	3
December	10	3
Total	**56**	**27**

a) Additional caribou surveys completed regularly throughout June and July, described in Section 12.

A total of 3,336 individuals from 16 identified wildlife species and 4 unidentified wildlife species groups (e.g., duck species) were recorded during surveys along the AWAR in 2021. A total of 529 individuals from 12 identified wildlife species and 5 unidentified wildlife species groups were recorded during surveys on the Mine site in 2021. These totals do not include caribou documented as part of the caribou behaviour monitoring (Section 12.1), caribou remote camera study (Section 12.2), or caribou advisory programs (Section 12.4). Although not currently listed under the federal *Species at Risk Act* (SARA), barren-ground caribou is under consideration for listing as Threatened under SARA (Government of Canada 2022).

One observation of two peregrine falcons (*Falco peregrinus*) was observed during surveys along the AWAR on 2 June 2021. Peregrine falcon, *anatum/tundrius* subspecies, is currently listed as a species of Special Concern under SARA; this species is under consideration for a status change under SARA to Not At Risk (Government of Canada 2022). No other species at risk were observed during wildlife surveys.

Snow goose (*Chen caerulescens*) was the most commonly recorded bird species with a total of 1,788 individuals observed along the AWAR. Large numbers of Canada goose, sandhill crane (*Grus canadensis*), and duck species were also frequently observed along the AWAR with a total of 879, 172, and 145 individuals recorded, respectively.

A total of 445 individuals from 10 identified species and 5 unidentified species groups were observed during surveys at Mine infrastructure other than the AWAR in 2021. Snow goose and Canada goose were the most frequently observed species with 196 and 104 individuals recorded, respectively. Mammal species recorded at Mine infrastructure included Arctic ground squirrel (*Urocitellus parryii*; 2 sightings), Arctic fox (*Vulpes lagopus*; 29 sightings/tracks), and Arctic hare (*Lepus arcticus*; 55 sightings/tracks). No species at risk were observed during surveys of Mine infrastructure in 2021.

Table 16: Wildlife Track Survey Observations (2021)

Common Name	Scientific Name	AWAR		Site	
		Number of Observations	Number of Individuals	Number of Observations	Number of Individuals
Mammals					
American pine marten	*Martes americana*	0	0	0	0
Arctic fox	*Vulpes lagopus*	11	12	20	29
Arctic ground squirrel	*Urocitellus parryii*	10	10	1	2
Arctic hare	*Lepus arcticus*	5	5	29	0
Caribou[(a)]	*Rangifer tarandus*	5	15	0	0
Gray wolf	*Canis lupus*	0	0	0	0
Muskox	*Ovibos moschatus*	0	0	0	0
Polar bear	*Ursus maritimus*	0	0	0	0
Wolverine	*Gulo gulo*	0	0	0	0
Mammal Species	NA	0	0	1	3
Birds					
American crow	*Corvus brachyrhynchos*	1	5	0	0
Baird's sandpiper	*Calidris bairdii*	1	2	0	0
Bald eagle	*Haliaeetus leucocephalus*	0	0	1	1
Bird species	NA	9	99	0	0
Brant	*Branta bernicla*	5	25	0	0
Canada goose	*Branta canadensis*	51	879	8	104
Common raven	*Corvus corax*	15	17	1	1
Duck species	NA	15	145	2	19
Greater white-fronted goose	*Anser albifrons*	2	4	1	2
Gull species	NA	17	72	1	2
Long-tailed duck	*Clangula hyemalis*	0	0	1	5
Peregrine falcon	*Falco peregrinus*	1	2	0	0
Ptarmigan species	*Lagopus* spp.	7	62	6	79
Raptor species	*NA*	0	0	2	2
Rough-legged hawk	*Buteo lagopus*	4	4	1	1
Sandhill crane	*Grus canadensis*	28	172	5	27
Snow goose	*Anser caerulescens*	39	1,788	9	196
Snowy owl	*Bubo scandiacus*	1	1	0	0
Tundra swan	*Cygnus columbianus*	9	17	1	1
	TOTAL	**236**	**3,336**	**91**	**529**

Note: Table includes all species previous identified during wildlife surveys or incidentals 2018 to 2021.
a) Caribou are documented as part of other survey types described in Section 12.

9.2 Wildlife Incidentals

In 2021, there were 94 recorded incidental observations, representing 280 individuals of 10 species, around the Mine site (including the camp area) and the AWAR (Table 17). Incidental wildlife observations were recorded between 16 January and 30 December 2021 through Wildlife Logs and Reports, and do not include mortalities or observations of large herds of migrating caribou. Information on caribou migration through the Mine site and AWAR is presented in Section 12.0.

The most frequently observed species were snow goose (99 individuals), Arctic fox (84 individuals), and Canada goose (44 individuals; Table 17). Species observed incidentally, and not during wildlife surveys include gray wolf (*Canis lupus*) and American pine marten (*Martes americana*).

Table 17: Incidental Wildlife Observations (2021)

Common Name	Scientific Name	2021	
		Number of Observations	Number of Individuals
American pine marten	*Martes americana*	2	2
Arctic fox	*Vulpes lagopus*	60	84
Arctic ground squirrel	*Urocitellus parryii*	2	2
Arctic hare	*Lepus arcticus*	12	23
Caribou	*Rangifer tarandus*	3	15
Gray wolf	*Canis lupus*	2	2
Muskox	*Ovibos moschatus*	0	0
Polar bear	*Ursus maritimus*	0	0
Wolverine	*Gulo gulo*	0	0
American crow	*Corvus brachyrhynchos*	0	0
Bald eagle	*Haliaeetus leucocephalus*	0	0
Brant	*Branta bernicla*	0	0
Canada goose	*Branta canadensis*	3	44
Common raven	*Corvus corax*	5	6
Duck species	NA	0	0
Greater white-fronted goose	*Anser albifrons*	0	0
Gull species	NA	0	0
Long-tailed duck	*Clangula hyemalis*	0	0
Peregrine falcon	*Falco peregrinus*	0	0
Ptarmigan species	*Lagopus* spp.	0	0
Rough-legged hawk	*Buteo lagopus*	0	0
Sandhill crane	*Grus canadensis*	1	3
Snow goose	*Anser caerulescens*	4	99
Snowy owl	*Bubo scandiacus*	0	0
Tundra swan	*Cygnus columbianus*	0	0
	TOTAL	**94**	**280**

Notes: Specific global positioning system (GPS) locations were not recorded for incidental wildlife observations in 2021. Wildlife mortalities and counts of large herds of migrating caribou are not included. Table includes all species previous identified during wildlife surveys or incidentals 2018 to 2021.

NA = not applicable

9.3 Den Sites

Prior to construction of Project infrastructure, surveys are required to locate dens of denning carnivores in accordance with NIRB Project Certificate 006. Den surveys were completed on 5 July and 15 August 2021 to locate dens of Arctic fox, grey wolf, polar bear, grizzly bear (*Ursus arctos*), American marten (*Martes americana*), and wolverine (*Gulo gulo*). Areas were searched on foot by qualified Environmental Technicians.

One Arctic fox den was observed approximately 375 m east of km 29 on the AWAR on 5 July 2021. Fox kits were observed at the time of survey. One Arctic fox den was observed 1.3 km west of the Meliadine Mine 15 August, 2021. Many entrances were observed, which may indicate that this den has been used for several years, and an individual fox was observed going down one of the entrances at the time of the survey. Full details on den surveys in 2021 are provided in Appendix D.

9.4 Bird Nests

Six incidental bird nests were observed on Site during the nesting season in 2021 (Table 18).

Table 18: Incidental Bird Nests and Approximate Location, 2021

Date Nest First Observed	Bird Species	Location	Approximate GPS Coordinates (NAD 83; Zone 15V)		Notes
			Northing	Easting	
01 April 2021	Common raven	3M Tank Farm	540151	6989115	No eggs; got a permit to remove the nest same day found
06 April 2021	Common raven	TIRI-02	-	-	Nest on an inactive wall North of TIRI-02; was decided to leave the nest alone
21 April 2021	Common raven	Construction Laydown	-	-	Nest on top of a metal structure in the construction laydown on Dyno Road; will be left alone since construction does not need the structure in the near future
26 April 2021	Common raven	TIRI-02	-	-	Nest removal authorization received; this was completed during the following night
22 June 2021	Sandhill crane	TSF	538800	6990050	2 eggs in nest, mitigation measures put in place (candles, closed one lane of road, reduced speed sign, etc.)
08 July 2021	Semipalmated plover	Pipe Pad	540964	6988246	Sitting on nest located south of pipe path, mitigation measures put in place

GPS = global positioning system
- = exact location was not recorded

9.5 Incidents and Mortalities

Mortalities can occur as wildlife interact with the Project site or become habituated to mining activities resulting from efforts to locate food or shelter (DDMI 1998). Diligent waste management, employee and environmental awareness, and immediate reporting of wildlife sightings in and around Project infrastructure can limit the mortality of wildlife.

9.5.1 Methods

Project-related incidents and mortalities are reported to the Environment Department for documentation in a detailed incident investigation for immediate follow-up. All incidental wildlife mortalities are reported immediately to the GN DoE, and the GN DoE is consulted for follow-up mitigation and disposal procedures. In addition, the KivIA will also immediately be notified of wildlife mortalities and the events and circumstances around that mortality. If wildlife had to be deterred to reduce the risk of a wildlife-human incident, then all efforts are made by the environmental technicians to start with the least intrusive method available, and all deterrent actions are recorded.

9.5.2 Results

A total of 37 mortalities and 2 wildlife incidents across 4 different species was reported at the Project from 2 February to 15 December 2021; 36 of these mortalities were suspected or confirmed to be caused as a direct result of Project activities (Table 19).

Table 19: Wildlife Mortalities and Incidents Reported in 2021

Date	Species	Number	Location	Comments
02 February 2021	Arctic hare	1	SP4	Non-project related mortality; unknown cause of death
11 February 2021	Arctic fox	1	TIRI-1	Project related mortality; habituated fox trapped in TIRI-1, euthanized and incinerated
26 April 2021	Arctic fox	1	Waste Rock Storage 3	Project related mortality; struck by vehicle
01 August 2021	Caribou	1	AWAR at km 17	Project related incident; caribou ran into truck – no apparent injuries
06 September 2021	Arctic fox	1	AWAR at km 19	Project related mortality; struck by vehicle
07 September 2021	Arctic fox	1	AWAR at km 13	Project related mortality; likely struck by vehicle
12 September 2021	Arctic hare	1	AWAR at km 19	Project related mortality; likely struck by vehicle
21 September 2021	Arctic fox	1	Drill 10	Project related incident; employee was attacked by fox and given rabies shots
22 September 2021	Arctic fox	1	Orbit Shop	Project related mortality; fox involved in attack trapped, euthanized and incinerated Traps were set at kitchen, orbit shop and incinerator
02 October 2021	Ptarmigan species	1	Process Plant	Project related mortality; cause of death unknown, bagged and frozen, awaiting further instructions from GN and HTO
04 October 2021	Arctic fox	1	Main Camp Kitchen	Project related mortality; Trapped and euthanized by GN Conservation Officer
13 October 2021	Arctic fox	1	Main Camp Kitchen	Project related mortality; Trapped and euthanized by GN Conservation Officer
18 November 2021	Arctic fox	1	Main Camp Kitchen	Project related mortality; Trapped and euthanized by GN Conservation Officer
29 November 2021	Arctic fox	1	Main Camp Kitchen	Project related mortality; Trapped and euthanized by GN Conservation Officer
30 November 2021	Arctic fox	3	Industrial Pad	Project related mortality; Trapped and euthanized by GN Conservation Officer One individual trapped at the kitchen, landfill, and incinerator

Table 19: Wildlife Mortalities and Incidents Reported in 2021

Date	Species	Number	Location	Comments
06 December 2021	Arctic fox	3	Industrial Pad	Project related mortality; Trapped and euthanized by GN Conservation Officer One individual trapped at the kitchen, landfill, and incinerator
07 December 2021	Arctic fox	4	Industrial Pad	Project related mortality; Trapped and euthanized by GN Conservation Officer
08 December 2021	Arctic fox	5	Industrial Pad	Project related mortality; Trapped and euthanized by GN Conservation Officer Two individuals at landfill, two at incinerator, and one at the kitchen
09 December 2021	Arctic fox	2	Industrial Pad	Project related mortality; Trapped and euthanized by GN Conservation Officer One individual at the kitchen, and one individual at the incinerator
14 December 2021	Arctic fox	1	Landfill	Project related mortality; Trapped and euthanized by GN Conservation Officer
15 December 2021	Arctic fox	1	Landfill	Project related mortality; Trapped and euthanized by GN Conservation Officer Traps were closed after the event due to the upcoming blizzard
15 December 2021	Arctic fox	2	Main Camp Kitchen	Project related mortality; Trapped and euthanized by GN Conservation Officer Traps were closed after the event due to the upcoming blizzard

One Project-related bird mortality was recorded in 2021. A ptarmigan (*Lagopus* sp.) was discovered deceased on a walkway within the Process Plant, after the doors to the plant had been left open in the early hours of the morning to provide the bird with an escape route. The ptarmigan was bagged and placed in a freezer to await further directives from GN DoE and HTO.

An incident occurred on 21 September 2021 in which an employee was attacked by an Arctic fox who repeatedly jumped onto the employee's shoulders and scratched the back of the employee's neck. The fox eventually left after the employee had fought back and the employee was given prompt medical attention. Following initial guidance from the GN DoE in response to incidents and observations of Arctic foxes in and around the Mine in 2017, the GN DoE directs Agnico Eagle to deploy traps to remove animals as necessary. The fox involved in the attack was trapped, euthanized and incinerated under the directives of GN DoE. GN Conservation Officers set up additional traps to capture Arctic fox following this event. The majority of mortalities in 2021 were related to trapping of Arctic fox. Another unrelated trapping event occurred on 11 February 2021, when a habituated fox was trapped, euthanized and incinerated.

9.6 Accuracy of Impact Predictions

A summary of the impact predictions proposed in the TEMMP (Agnico Eagle 2020a) is provided in Table 20. Through systematically recording the presence of all wildlife within and around the Project footprint, Environmental staff will remain appraised of current and emerging issues and will be able to manage issues as they arise. To use a common example, surveillance monitoring may detect that wildlife has gained access and is taking shelter beneath a building.

The thresholds presented in Table 20 have been employed for the Mine to date for consideration of any adaptive management for the TEMMP (Agnico Eagle 2020a). Refinement of these thresholds may be considered, in collaboration with the GN, as appropriate, as more data is collected and analysed over time.

Table 20: Accuracy of Impact Predictions – Wildlife Incidents 2021

Monitoring Indicator	Preliminary Threshold	Exceeded in 2021?	Adaptive Management	Monitoring Method	TEMMP Section
Vehicle Collisions	No more than 1 ungulate/year	No	No action required	Wildlife Sightings Log, Site Surveillance Monitoring, AWAR Road Surveillance, Road Surveillance	9.5.2
Project Related Mortality[(b)]	No more than 1 ungulate/year	No	No action required	Wildlife Sightings Log, Site Surveillance Monitoring	9.5.2
Project Related Mortality[(a)]	No more than 1 Arctic fox/year	Yes	On-going waste management and, regular toolbox meetings reiterating that any disrespect of wildlife or of Meliadine's wildlife policy is unacceptable and against company rules	Wildlife Sightings Log, Site Surveillance Monitoring, with particular emphasis around waste management areas	9.5.2
Project Related Mortality[(a)]	No more than 1 raptor/year	No	Not currently identified	Wildlife Sightings Log, Site Surveillance Monitoring	9.5.2
Project Related Mortality[(a)]	No more than 1 waterbird/year	No	On-going and regular toolbox meetings on awareness of blind-spots, particularly for large vehicles and equipment	Wildlife Sightings Log, Site Surveillance Monitoring	9.5.2

TEMMP = Terrestrial Environment Management and Monitoring Plan
(aProject related Mortality = A death that can be directly linked to the mine or mining activity.

9.7 Recommendations

Thresholds for Arctic fox were exceeded in 2021. Other mortalities are within predicted thresholds. Diligent waste management practices, employee and environmental awareness, and immediate reporting of wildlife sightings in and around Project infrastructure to limit mortality of wildlife should be continued.

10.0 WILDLIFE DETERRENTS

Wildlife deterrents were implemented at six locations to deter birds from nesting. Fake coyotes, balloons, kite owls and reflector tourniquets were placed at the 3M tank farm, Itivia fuel farms, wetlands and TIRI-02 to deter ravens and raw legged hawks from nesting. Firecrackers and bangers were discharged at geese and cranes at TSF to prevent birds from going into the runoff. Additionally, propane cannons were implemented at TIRI-01 and TIRI-02 to deter bird nesting.

11.0 MUSKOXEN

Agnico Eagle has provided the GN DoE with in-kind contributions and support for previous muskoxen surveys and will continue to do so when requested. No surveys were completed by the GN DoE in 2021, consequently no in-kind contributions were requested.

12.0 BARREN-GROUND CARIBOU

Barren-ground caribou (including the Lorillard and Qamanirjuaq herds) currently have a federal status of 'Threatened' but are not currently listed under the *Species at Risk Act* (Government of Canada 2022). Barren-ground caribou are considered 'Apparently Secure' in Nunavut (CESCC 2016). Annual home ranges mapped by GN DoE show that the Project is within the annual home range of the Qamanirjuaq (pronounced "Kaminuriak") caribou herd (Campbell et al. 2012, 2014). The Lorillard caribou are migratory (Campbell et al. 2014) and generally distributed north of Chesterfield Inlet, based on telemetry data collected by the GN DoE and the location of their historical calving grounds (Campbell et al. 2012). The likelihood of animals from the Lorillard herd occurring in the RSA for the Mine, as defined in the FEIS (Golder 2014), is very low. Baseline survey data documenting the distribution of barren-ground caribou during early winter, spring migration and calving, and post-calving through fall migration and rut periods suggest that the RSA is within the seasonal range of the Qamanirjuaq barren-ground caribou herd (Jalkotzy 1999, 2000, 2001). The annual range of the Qamanirjuaq herd occupies an area from northern Manitoba and Saskatchewan in the south, to southwestern NU and southeastern NT (BQCMB 1999; Campbell et al. 2012). Barren-ground caribou are migratory, and movements and range use varies annually (Wakelyn 1999). The annual distribution and life history of this population has been previously documented (Banfield 1954; Kelsall 1968; Thomas 1969; Parker 1972; Heard 1986). The Qamanirjuaq herd calves approximately 57 km to the west-northwest of the Mine and after calving the herd aggregates into a post-calving movement, generally moving east towards the coast and then back to the west and southwest of the Mine where their summer movement and distribution patterns commence. During the post-calving movements to the coast, thousands of caribou can come through the Meliadine Mine site and reside within and around the Project area for approximately 5 to 10 days during late June to mid-July (Nuqsana Golder 2020). For additional discussion on the Qamanirjuaq herd please refer to the FEIS (Golder 2014).

12.1 Caribou Behaviour Monitoring

The TEMMP indicates that once 50 caribou are observed within 5 km of the Project footprint boundary (visual detection or based on collar data provided by the GN), a stop work procedure commences on site. Monitoring caribou behaviour in proximity to the mine is integral to understanding how caribou interact with the Project infrastructure including roads (i.e., crossing, deflection, walking parallel) and other Project infrastructure. Documenting behaviour through activity budgets may better inform appropriate adaptive management and distance triggers and thresholds in the future. Over time, a long-term dataset will be used to evaluate obvious response or lack of obvious response of caribou to mining based on behaviour.

The overall objectives of the caribou behaviour monitoring program are to determine if caribou activity budgets change with distance from the mine, and to document caribou response to stressors. Activity budgets (i.e., time spent feeding, resting, walking, running) of caribou exposed to disturbances from the Mine and AWAR will be used to provide inputs for assessing the impact to the energy balance of caribou (see Section 4.5.2 of the TEMMP, Agnico Eagle 2020a, for additional discussion). The immediate effect of specific stressors (e.g., aircraft, vehicles, other wildlife) on caribou behaviour will also provide general insight into the relative effect of natural, Project-related, and community-related (i.e., ATV traffic and harvesting) road stressors on caribou behaviour. Consequently, opportunistic surveys should be completed when appropriate to do so during the caribou post-calving migration, without causing additional stress to caribou (based on surveyor opinion).

An external caribou behaviour expert (from ERM Consultants Canada Ltd.) was brought on site in 2020 and 2021 to conduct the behaviour monitoring program, and to provide training for the Meliadine Mine Environmental Technicians. The specific objectives outlined by the caribou behaviour monitoring study in 2020 and 2021 were (Appendix E; ERM 2021a):

- To conduct a study using the Government of Northwest Territories Department of Environment and Natural Resources (GNWT ENR 2017) behaviour survey methodology at the Project site to estimate how the AWAR and site infrastructure contribute to cumulative effects of the project on caribou.
- To collect a set of 100 samples of caribou behaviour across two years (2020 and 2021).
- To use information from the surveys to determine what factors predict caribou behaviour, specifically comparing:
  - near vs. far;
  - large groups of caribou vs. small groups; and
  - surveys with and without disturbances.

12.1.1 Methods

Ground-based behavioural observations, or scan sampling, are conducted to provide data on changes in caribou behaviour as a function of distance from the Project. Two different, but complementary approaches have been used to record the activity budget of caribou around the Project and AWAR. See the TEMMP (Agnico Eagle 2020a) for additional details on the behaviour scan method. ERM was on site in June and July in both 2020 and 2021. Training provided to Meliadine Mine Environmental Technicians included:

- Providing a Standard Operation Procedures for behaviour monitoring.
- A training slide show with examples of each behaviour type.
- A recorded version of the slide show for those technicians who could not attend.
- Example filled-in datasheets.
- A practical test of identifying caribou behaviours in a PowerPoint presentation.
- Practical in-field training.

Surveys were conducted by ERM and Agnico Eagle technicians. In total, 56 behaviour monitoring sessions were completed in 2020, and 46 in 2021. Behavioural surveys were conducted from 1 to 17 July 2020, and 29 June to 12 July 2021. Following data collection in 2020, and protocols were updated for the 2021 season to include use of a laser range finder to determine distance of caribou from roads, and side of road (east or west) that caribou were observed. Surveys were 30 minutes in duration, with observations collected every three minutes.

Generalized linear models (GLMs) were developed to statistically test for differences in the behavioural responses of surveyed animals to various sources of disturbance. One analysis focused on the average proportion of response behaviours in each thirty-minute survey period using a binomial distribution. A second analysis focused on tracking the number of minutes it took caribou to return to background behaviour levels following a disturbance event and was modelled using a normal distribution.

12.1.2 Results

The following provides a summary of caribou behaviour monitoring completed during 2020 and 2021. Further details are provided in Appendix E. Field surveys were conducted as the Qamanirjuaq herd was observed approaching the Project to trigger the decision to begin behaviour surveys.

Sample size was distributed across group sizes for the 102 surveys completed (Table 21). Over half of all surveys incidentally involved at least one disturbance (e.g., ATV traffic).

Table 21: Meliadine Caribou Behaviour Surveys Data Summary.

Caribou Group Size	2020			2021		
	Total Number of Surveys	Surveys with Disturbances	Surveys with Observed Road Crossings	Total Number of Surveys	Surveys with Disturbances	Surveys with Observed Road Crossings
1-2	5	4	2	8	5	0
3-25	11	2	2	11	7	3
26-50	9	3	0	2	0	0
51-500	14	11	1	16	8	6
501-1000	6	3	1	0	0	0
>1000	11	6	0	9	7	3
Total	**56**	**29**	**6**	**46**	**27**	**12**

In 2021, Small groups (<50 caribou) were observed equally across all distances from the AWAR; larger groups tended to be observed further (>300 m) from infrastructure. Its plausible that larger groups are easier to detect at further distances than smaller groups. Difference in behaviour on upstream and downstream sides of the road was not observed. In both years, small groups had higher proportions of response behaviours (running and alert behaviours) compared to large groups. Overall, trends observed were similar between 2020 and 2021.

Statistical analysis of 2020 and 2021 data found that caribou farther from infrastructure (>300 m) displayed lower proportions of response behaviours, however the relatively small sample size was noted. Environmental variables (e.g., temperature and wind speed) were not related to proportion of response behaviours in caribou groups. The proportion of response behaviours in groups increased following disturbances, but behaviours usually returned to baseline levels after six minutes.

Further explanation of statistical analyses and results of the caribou behaviour monitoring program are contained in Appendix E.

12.2 Caribou Remote Camera Study

The following section is a summary of the Caribou Trail Camera Study (2021), completed by ERM (ERM 2021b). In 2020 and 2021, a study was conducted using motion-trigger cameras to study caribou interactions with the Project infrastructure during their annual migration, and particularly the AWAR. The study was designed to identify features of the AWAR (i.e., slope, substrate, height, and surrounding habitat) that may facilitate higher rates of caribou passage. Cameras were also placed at locations identified by community members and Inuit Elders from Inuit Qaujimajatuqangit (IQ) where caribou more frequently crossed the road. The survey protocol in 2021 followed that used in 2020, with minor improvements intended to increase the reliability of results. Full details on the study are provided in Appendix F.

12.2.1 Methods

Twenty-seven cameras were placed along the AWAR in mid June 2021, and were removed in mid July. Cameras were placed approximately 2 metres west of the AWAR, facing north; and took both timed and motion-triggered photos. ERM personnel reviewed all photos from the cameras and recorded every detection from wildlife. Road survey data from 2020 was used and included; height above tundra, width, side-slope, surfacing material (esker vs. quarry rock, and size), and surrounding vegetation type. Four cameras were spaced in quarters along the AWAR and set up facing the road to specifically capture vehicle passage. These cameras were analysed for vehicle traffic.

12.2.2 Results

Overall, the key findings from the camera study included (Appendix F):

- The cameras were successful at capturing many caribou crossing the AWAR, with peak caribou passage occurring one week earlier in 2021 vs 2020. This is consistent with patterns of inter-annual variability observed in the collar data.
- Caribou crossing timing and locations in 2021 were consistent with locations identified in 2020 and with locations identified by IQ from Inuit Elders and community members. The hotspots identified by the camera data in both 2020 and 2021 aligned more closely with the IQ identified hotspots than the collar data from 2012-2019.
- Road height and road-side slope at each camera location was not related to the number of caribou observed with each camera, suggesting that differences in the structure of the AWAR road was not influencing the locations where caribou cross the road. Alternatively, since the structure of the road is relatively uniform along its length, there may not be enough difference in the shape or profile of the road to influence which sections of the road caribou prefer to cross.
- More caribou were observed on cameras on the northern half of the road. Esker material is more common as a substrate on the northern half of the road which may suggest caribou prefer crossing on esker material. However, this may be an artifact of a sampling bias in the data.
- All recorded caribou crossings occurred between 5 minutes and 8.75 hours of a vehicle passing, with an average of 1.3 hours. The type of vehicle (heavy vehicle, light truck, or quad) had no apparent effect on the lag time to caribou crossing. Vehicle results should be treated with caution, as caribou may pass behind a camera or out of range of the camera motion detector, and therefore not all caribou crossings will be captured.

Further explanation of analyses and results of the caribou trail camera study are contained in Appendix F.

12.3 Collared Caribou Inventory

Analysis of Qamanirjuaq collared caribou from 1993 to 2019 indicate presence in the RSA (including baseline) in 13 of 27 years and alternate between periods of presence and absence through time (Nuqsana Golder 2020). Alternating periods of presence and absence of caribou in the RSA has been noted by IQ (Golder 2014). Collared caribou have typically entered the RSA in mid- to late- April. Annual exits from the RSA have been more variable ranging from late April to October. Evidence from collared caribou support that a portion of the Qamanirjuaq herd may pass through the RSA in summer but on occasion may in some years linger from late October through March (Hubert and Associates 2007; Nuqsana Golder 2020). When present, collared caribou spend about one to three weeks in the RSA and over all years are present for an average of 6 days.

Qamanirjuaq collared caribou have been present in 10 of 27 years in the LSA (Nuqsana Golder 2020). Collared caribou from this herd typically enter the LSA in early to mid-July and leave within a couple of days. Over all years, collared caribou spend less than half a day inside the LSA. In consideration of these results, impacts to the Qamanirjuaq herd due to the Project have the potential for limited transboundary effects. The collar data also support that caribou are spending very little time in the areas immediately adjacent to the Project. A data sharing agreement for caribou collar data with the GN DoE is currently being developed. Past analysis of collar data interactions with the Mine infrastructure and AWAR in indicate no strong local scale deflection effects although more regional effects have not been assessed (Appendix E in Golder 2021).

12.4 Caribou Advisory

The objective of the Caribou Advisory Monitoring program is ensuring workers are aware of the approximate numbers of caribou on and in close proximity to the Project, which is related to the potential for interactions between caribou and mining activities. The Caribou Advisory raises general awareness so that employees are alert to the likelihood that mitigation could be triggered, and what mitigation entails. The number of animals near the Project and in specific areas dictates the type of mitigation practices that will be undertaken (e.g., haul road closure, closing specific areas at the Mine site, speed reduction).

12.4.1 Methods

Agnico Eagle, in collaboration with the GN and KivIA and including participation of the KHTO, undertake the implementation of a caribou monitoring and work suspension protocol during caribou migration to minimize sensory disturbance at the Project site and along the AWAR. KHTO and KivIA members typically assist Agnico Eagle staff conducting surveys during caribou migration. In 2020 and 2021, due to concerns around the COVID-19 pandemic, adaptative measures were taken to ensure contacts between the community members and Agnico Eagle employees were avoided. In accordance with the Detached Operation Protocol, KHTO led the convoys when travel was required on the AWAR (equipment transportation or employee buses) during the caribou migration. Communication protocols built into the work suspensions are designed to be broadcast swiftly and broadly among all departments in real time. The Environmental Department monitored caribou presence as per the caribou migration protocol (TEMMP Appendix III; Agnico Eagle 2020a) including the use of collar data and regular surveys, and issued caribou advisories. Regular surveys for caribou, were completed by on site Environmental Technicians , and consisted of ground surveys at multiple locations, at regular intervals throughout the day (i.e., 06:00, 12:00, 18:00) during caribou migration. The results of the surveys were communicated to all Project Departments, including the KivIA and KHTO, indicating if any work stoppages or restrictions are required and the affected work areas.

A decision tree is used to guide adaptive monitoring and mitigation based on results of surveys. Three action levels are outlined in the decision tree:

- Level 1: triggered when 50 or more caribou are observed within 10 km of Meliadine based on ground surveys or review of satellite collar data. Ground surveys are completed every two days, and satellite collar data is reviewed twice per week. Site-wide warnings are issued daily. Level 1 is ongoing for 5 days, or until Level 2 is triggered.
- Level 2: triggered when less than 50 caribou are observed within 5km of Meliadine. Ground surveys are completed every two days, and satellite collar data is reviewed twice per week. Additional mitigation (e.g., work suspension), may be implemented by the Environmental supervisor. Site-wide warnings are issued daily. Level 2 is ongoing for 10 days; or until caribou exit the 5 km mark or Level 3 is triggered.

- Level 3: triggered when 50 or more caribou are observed within 5km of Meliadine. Ground surveys are completed three times per day, and satellite collar data is reviewed at least twice per week. A work suspension protocol is implemented. Site-wide warnings are issued three times per day. Level 3 is ongoing until caribou exit the 5km mark.

12.4.2 Results

The Qamanirjuaq herd caribou migration through the Project area was monitored from 22 June through 25 July 2021. Peak migration timing occurred approximately one week earlier than in 2020 (Section 12.2; Appendix E). Site and AWAR surveys were completed three times daily throughout this period by AEM personnel. Shutdowns affecting different components of the Mine were implemented to facilitate the safe migration of caribou through the Local Study Area. Shutdowns are summarized in Table 22. This includes closures along the AWAR for a total of 122.5 hours across 10 days. Vehicle traffic on site was restricted for 194.75 hours across 12 days. Open pit operations were shutdown for 211 hours across 12 days. The Exploration Camp was shutdown for 215.5 hours across 14 days. Activities at the Main Camp were restricted for 209.5 hours across 14 days. Flights were cancelled June 30, July 1, July 2, and July 16. Helicopters unrelated to Agnico Eagle were observed flying over Meliadine Mine on 25 June, 28 June, and 05 July, 2021 and reported to KIA.

Table 22: Caribou Advisories Meliadine 2021

Date	AWAR		Vehicle Traffic on Site		UG Operations		OP Operations		Explo Camp Area		Main Camp		Mitigation Level	Mitigation Trigger
	Time	Hours Closed	Time	Hours Closed	Time	Hours Closed	Time	Hours Closed	Time	Hours Closed	Time	Hours Closed		
2021-06-22	-	-	-	-	-	-	-	-	-	-	18:00	6.00	Level 3	A large herd of caribou was observed north of the mine.
2021-06-23	-	-	6:00	24.00	-	-	-	-	6:00	24.00	6:00	24.00	Level 3	Large herds of caribou observed on the other side of Meliadine Lake. Caribou were observed at AWAR km 19 east side; roughly 8 to 10 km away.
2021-06-24	-	-	6:00	24.00	-	-	6:00	24.00	6:00	24.00	6:00	24.00	Level 3	Large herds of caribou present on the other side of Meliadine Lake. Caribou were observed at AWAR km 19 east side; roughly 7 to 10km away.
2021-06-25	-	-	6:00	24.00	-	-	6:00	24.00	6:00	24.00	6:00	24.00	Level 3	Large herds of caribou present within the 5 km protection zones of the mine site. Large groups of caribou were observed 2 to 3 km away to the east and west of the AWAR.
2021-06-26	-	-	6:00	24.00	-	-	6:00	24.00	6:00	24.00	6:00	24.00	Level 3	Large herds of caribou present within the 5 km protection zones of the mine site, including a large herd to the southwest of the mine. A smaller group of 100 to 200 caribou crossed the lake in the area west of CP1.
2021-06-27	-	-	-	-	-	-	-	-	-	-	-	-	Level 2	Less than 50 caribou observed within the 5 km protection zones of Meliadine. A small group (7 caribou) were observed approximately 300 m from AWAR km 16.
2021-06-28	-	-	-	-	-	-	6:00	24.00	9:15	14.75	9:15	14.75	Level 3	Greater than 50 caribou within the 5 km protection zones of Meliadine. A small group observed just outside of the 5 km radius to the northeast, and one to the south, as well as many large herds further out from the AWAR.
2021-06-29	16:00	8.00	6:00	24.00	-	-	6:00	24.00	6:00	24.00	6:00	24.00	Level 3	The large herd (several thousand) of caribou re-entered the 5 km protection zones from the west. A smaller group (100) were observed on the eastern side of the Waste Rock Storage Facility 3 (WRSF3). AWAR closed following completion of convoy.
2021-06-30	6:00	24.00	6:00	24.00	-	-	6:00	24.00	6:00	24.00	6:00	24.00	Level 3	Several thousand caribou within the 5 km protection zones of the mine site, with large groups moving south throughout the day.
2021-07-01	6:00	24.00	12:00	12.00	-	-	7:00	18.00	12:00	12.00	12:00	12.00	Level 3	Greater than 50 caribou were observed within the 5 km protection zones of the mine site. Caribou were observed on the road near AWAR km 20.
2021-07-02	18:00	8.00	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou observed within the 5 km protection zones of the mine site. Caribou observed along AWAR in the afternoon.
2021-07-03	0:00	12.00	-	-	-	-	-	-	12:00	12.00	-	-	Level 3	A herd of approximately 1000 caribou was observed to the east of Meliadine Lake.
2021-07-04	-	-	12:00	12.00	-	-	18:00	12.00	12:00	12.00	12:00	12.00	Level 3	More than 50 caribou observed within the 5 km protection zones of the mine site. In the evening, less than 50 caribou were observed within the 5 km protection zones of the mine site.
2021-07-05	-	-	13:00	3.00	-	-	13:00	3.00	13:00	3.00	13:00	3.00	Level 3	Caribou entered the 5 km protection zones of the mine site mid-day. In the evening, less than 50 caribou were observed within the 5 km protection zones of the mine site.
2021-07-06	-	-	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine site, nor along the AWAR.
2021-07-07	-	-	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou observed within the 5 km protection zones of the mine site. Small groups were observed greater than 100 m from the AWAR.
2021-07-08	-	-	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine site. Small group (3 caribou) were observed 1 km east of AWAR km 24.
2021-07-09	-	-	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine site, nor along the AWAR.
2021-07-10	10:30	2.50	10:30	2.50	-	-	10:30	4.00	10:30	2.50	10:30	2.50	Level 3	In the morning, greater than 50 caribou entered the 5 km protection zones of the mine site, and were approaching AWAR km 29. The group moved out of 5 km protection zones in afternoon. In the evening, caribou were observed east side of Meliadine lake.
2021-07-11	-	-	-	-	-	-	-	-	-	-	-	-	Level 3	Caribou were observed on the east side Meliadine lake inside the 5 km exploration camp radius. The group left the 5 km radius in the afternoon.
2021-07-12	18:00	8.00	12:00	12.00	-	-	9:00	15.00	12:00	6.00	12:00	6.00	Level 3	Caribou were observed within the 5 km protection zones of the mine site in the afternoon.
2021-07-13	-	-	15:45	9.25	-	-	9:00	15.00	15:45	9.25	15:45	9.25	Level 3	Large group of caribou was observed within the 5 km protection zones of the mine site.

Table 22: Caribou Advisories Meliadine 2021

Date	AWAR		Vehicle Traffic on Site		UG Operations		OP Operations		Explo Camp Area		Main Camp		Mitigation Level	Mitigation Trigger
	Time	Hours Closed	Time	Hours Closed	Time	Hours Closed	Time	Hours Closed	Time	Hours Closed	Time	Hours Closed		
2021-07-14	12:00	12.00	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine site. In the evening 1000+ caribou were observed along AWAR km 10, approximately 1 km from the road.
2021-07-15	-	-	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine.
2021-07-16	6:00	18.00	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine, however 5000+ were observed along AWAR km 8 to 10.
2021-07-17	6:00	6.00	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine site, however 1000+ were observed along AWAR km 8 to 15. In the evening, small groups (15 to 25) were observed along AWAR km 10 to 16.
2021-07-18	-	-	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine site, however small groups (5 to 15) were been observed along AWAR km 8 to 15.
2021-07-19	-	-	-	-	-	-	-	-	-	-	-	-	Level 2	No caribou were observed within the 5 km protection zones of the mine site, however a groups (1500 to 2000) were observed along AWAR km 14. In the afternoon, a group (<10) was observed along AWAR km 12.
2021-07-20	-	-	-	-	-	-	-	-	-	-	-	-	Level 1	No caribou were observed within the 5 km protection zones of the mine site, however one caribou was observed along AWAR km 13.
2021-07-21	-	-	-	-	-	-	-	-	-	-	-	-	Level 1	No caribou were observed within the 5 km protection zones of the mine site.
2021-07-22	-	-	-	-	-	-	-	-	-	-	-	-	Level 1	No caribou were observed within the 5 km protection zones of the mine site.
2021-07-23	-	-	-	-	-	-	-	-	-	-	-	-	Level 1	No caribou were observed within the 5 km protection zones of the mine site.
2021-07-24	-	-	-	-	-	-	-	-	-	-	-	-	Level 1	No caribou were observed within the 5 km protection zones of the mine site.
2021-07-25	-	-	-	-	-	-	-	-	-	-	-	-	Level 1	No caribou were observed within the 5 km protection zones of the mine site.
Total hours lost	122.50		194.75		0		211.00		215.50		209.50			

12.4.3 Traffic Data

A total of 20,323 one-way trips along the AWAR were recorded in 2021, with an average of 1,693.8 trips per month (Table 23). Traffic rates were lowest in February, and highest in September. Pickup trucks and tractor-trailers were large contributors to traffic rates, followed by water tankers, fuel tankers, and buses. The number of one-way trips in 2021 was higher than the 17,422 one-way trips in 2020 (Golder 2021).

Table 23: AWAR Traffic by Month (2021).

Vehicle Type	January	February	March	April	May	June	July	August	September	October	November	December	Total
Ambulance	5						4		2	8	4		23
Backhoe	2					4	3			1	2		12
B-Train					1			8		13			22
Bus	184	177	226	221	213	230	206	169	207	204	232	207	2,476
Crane				1						1			2
Flatbed Tractor			5	18				10		2			35
Fuel Tanker	286	312	252	214	165	135	212	201	162	205	164	197	2,505
Fuel Truck	11	10	10	10	9	6	22	30	24	11	13	4	160
GN - Pickup						2	2	2	3	6		8	23
Grader	37	50	41	42	26	27	21	28	41	19	38	30	400
Haul Truck		4		9		17	17	75	248	169	4		543
Hino-luggage	73	42	20	48	105	92	36	30	46	49	24	19	584
Hyster			1			2							3
HTO - ATV					10	2							12
HTO - Bus													0
HTO - Pickup			1	3		32	32		20	17	24	14	143
KIA - Pickup						9	6						15
Local-ATV					8	134	200	149	142	82	24		739
Local-Vehicle						7							7
Loader		5	2	27	1	1	1	12	3	4	1	3	60
Oversized load													
Pickup	357	164	239	195	324	392	456	407	582	451	364	246	4,177
Roll Off truck		4	5	2	2		10	44	33	7	15	6	128
Service Truck	2			4	2	3	2	4	6	5	5	11	44
Sewage Truck	10	12	12	10	8	16	19	14	26	24	24	9	184
Snowblower	14	22	35	22	3						8	24	128
Telehandler						3							3
Tractor-trailer	310	246	295	299	473	332	635	687	597	715	467	271	5,327
Van							2						
Water Tanker	9	12	0	2	1	6	10	505	1747	250		1	2,543
Water Truck	7	1	9	2	4	2	0						25
Total	**1,307**	**1,061**	**1,153**	**1,129**	**1,355**	**1,454**	**1,896**	**2,375**	**3,889**	**2,243**	**1,413**	**1,050**	**20,323**

12.5 Accuracy of Impact Predictions

A summary of the impact predictions proposed in the TEMMP (Agnico Eagle 2020a) is provided in Table 24. Though not fully developed, the following thresholds are suggested as a starting point for adaptive management and TEMMP (Agnico Eagle 2020a) refinement and is tested against the results of the 2021 observational data (Table 24).

Table 24: Accuracy of Impact Predictions - Caribou

Monitoring Indicator	Preliminary Threshold	Exceeded in 2021?	Adaptive Management	Monitoring Method	TEMMP Section
Habitat Loss and Degradation	No greater than 2,950 ha of terrestrial habitat loss	No	Not Currently Identified	Aerial photographs, satellite imagery, ground surveys, GIS analysis	5.0
Sensory Disturbance	<10% caribou deflections from AWAR	Not assessed in 2021	Not Currently Identified	Caribou Behaviour Monitoring	12.5
Vehicle Collisions	No more than 1 ungulate/year	No	No action required	Wildlife Sightings Log, Site Surveillance Monitoring, AWAR Road Surveillance, Road Surveillance	9.5
Hunting by Rankin Inlet Residents	After 3 years of data collection in collaboration with GN, establish a threshold level	Not assessed in 2021	Not Currently Identified	Hunter Harvest Survey, data collected throughout the year and reported annually	13.0
Other Project Related Mortality	No more than 1 ungulate/year	No	No action required	Wildlife Sightings Log, Site Surveillance Monitoring	9.5
Exposure to Contaminated Water or Vegetation	SLRA – TBD	NA	Not Currently Identified	Vegetation and soil samples	NA

AWAR = All-Weather Access Road; GN = Government of Nunavut Department of Environment; TEMMP = Terrestrial Environment Management and Monitoring Plan; NA = not applicable; <= less than; TBD = to be determined

13.0 HUNTER HARVEST SURVEY

Agnico Eagle signed a Memorandum of Understanding (MOU), in principle, with the KHTO in March 2019 for the development and execution of a Hunter Harvest Survey (HHS). The HHS supports Project Certificate No.006 Term and Condition 46 and 48.

In 2021, an external consultant, Nunavut Environmental Consulting, was contracted to work alongside the KHTO to conduct the study. The full Hunter Harvest Study report is provided in .

13.1 Methods

The wildlife species that are the focus of the HHS are caribou, muskox, grizzly bear, polar bear, wolf, wolverine, Arctic fox, goose, ptarmigan, and seal. However, harvest data on other species, such as beluga (*Delphinapterus leucas*), common eider (*Somateria mollissima*), and sandhill crane are also collected. The species in the study were deliberately chosen to make data entry and collection as simple as possible. To support creel surveys, data on fish harvest (Priority species = Arctic char, lake trout, lake whitefish, and Arctic grayling) were also collected.

Inuit and non-Inuit residents, at least 16 years of age, are eligible to participate in the harvest survey. Harvest calendars are provided on a household basis, rather than an individual basis, to simplify data entry and collection, and reflect household hunting patterns. The harvest calendar is attractive and consists of local photographs of wildlife and Nunavut residents. Space is provided for each calendar day where harvest details can be documented.

A map is provided at the end of the calendar that delineates a 5 km^2 UTM grid around the Rankin Inlet and Meliadine mine areas, and regions indicated as important for hunting during discussions with HTO members. Each grid has a unique code to facilitate recording of information. When calendars are issued, participants or participating households are encouraged to write harvest details (e.g., number of animals, sex, age, and location (i.e., grid code) for the appropriate date on the calendar.

Participants were interviewed in person three times during the year (i.e., June 2021, October 2021, and January 2022) by the harvest study coordinator. During the January 2022 interviews, remaining data from 2021 were collected. The purpose of the interviews is to ensure all harvest data are recorded on the calendars and to collect incidental information to compliment calendar data, including notable Caribou movements, aggregations, and unique observations. Between interview periods, participants were often contacted by phone or social media to encourage recording of harvest data.

Features of the 2021 Hunter Harvest Study included:

1) building long-term relationships between participants and researchers;

2) increasing engagement with participants on social media platforms such as Facebook and Instagram; and

3) increasing incentives for participating in the study (e.g., gas vouchers and prizes).

13.2 Results

The 2021 HHS Study included 40 participants amongst which 30 reported harvesting caribou. Given an estimated 300 to 350 active hunters in the Hamlet of Rankin Inlet, the HHS represents from 9 to 10% of hunters in the community. With a total reported caribou harvest of 670 in 2021, the total Caribou harvest in Rankin Inlet is estimated to range from 6,700 to 7,444 caribou. This estimate is likely high because the current study attracted some of the more successful hunters (e.g., Kangiqliniq Hunters and Trappers Organization members) in the

community and total number of active hunters may be less than 300 to 350.

Of Caribou harvests reported by Rankin Inlet participants in 2021, 3.7% were harvested within 5 km of the Meliadine All-Weather Access Road (AWAR), which compares to 4.5% during the Nunavut Wildlife Management Board's (NWMBs) harvest study from 1996 to 2001 (pre-construction) (Table 25). Harvests within the Meliadine Mine Regional Study Area in 2021 were 19.7% of the total compared to 24.8% during the NWMB study. These very preliminary numbers suggest that the presence of the AWAR and the Meliadine Mine has not increased hunting in the area.

Table 25: Caribou Harvest Distribution along the AWAR and within the Rankin Inlet LSA and RSA (1996 to 2001 [NWMB], and 2021 [Rankin Inlet HHS])

Study	Participation Rate within 5 km of AWAR (# of hunters)	Average Caribou Harvest within 5 km of AWAR per Participant	% of Annual Harvest within 5 km of AWAR	% of Annual Harvest within Meliadine LSA	% of Annual Harvest within Meliadine RSA
NWMB 1996 to 2001 (Rankin Inlet)	32	4.1	4.5	0.3	24.8
Rankin Inlet HHS 2021	5	5.0	3.7	3.3	19.7

AWAR = All-weather Access Road; HHS = Hunter Harvest Study; LSA = Local Study Area; NWMB = Nunavut Wildlife Management Board; RSA = Regional Study Area.

Fourteen (14) muskox, two (2) wolverine, and 18 wolves were harvested in 2021. Other harvested terrestrial mammals included Arctic fox and Arctic hare. In the marine environment, ringed seal (*Pusa hispida*; 25 individuals) was the most common species harvested followed by beluga (*Delphinapterus leucas*; 11), bearded seal (*Erignathus barbatus*; 2) and walrus (*Odobenus rosmarus*; 3).

A considerable number of bird species were harvested by Rankin Inlet participants in 2021 with Canada goose (134 individuals) and snow goose (126) harvested at the highest levels. Gulls (*Larus* sp.), ptarmigan (*Lagopus* sp.), sandhill crane, and northern pintail were also harvested.

Arctic char (*Salvelinus alpinus*; 628 fish) and lake trout (*Salvelinus namaycush*; 216 fish) were the most common species caught by fisherman. Relatively small numbers of Arctic cod (*Arctogadus glacialis*), Arctic grayling (*Thymallus arcticus*), lake whitefish (*Coregonus clupeaformis*), and burbot (*Lota lota*) were caught.

13.3 Recommendations

The Rankin Inlet Hunter Harvest Study and Creel Survey should be continued on an annual basis to monitor the hunting and fishing patterns of Rankin Inlet residents, and the potential effects of the mine and AWAR. Meetings with participants at certain intervals throughout the year will be particularly important in maintaining contact, building relationships, expanding the study, and collecting good harvest data.

Participation rates can be maintained by continuing to use social media platforms, expanding connections on these platforms, ensuring that all participants are visited during the three scheduled field visits, and continuing with distribution of the well-received year-end prizes while in the community. An effort should be made to bringing on new participants in 2022.

14.0 CLOSURE

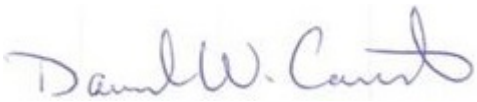
We trust the above meets your present requirements. If you have any questions or require additional information, please do not hesitate to contact the undersigned.

Your Truly,

Golder Associates Ltd.

Scott Wilson, M.Sc.
Biologist

Charity Beres signing on behalf of
Corey De La Mare, P.Biol.
Principal, Project Director and Senior Wildlife Biologist



Dan Coulton, Ph.D., R.P.Bio.
Wildlife Biologist

SW/CDML/rd

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APPENDIX A

Inuit Qaujimajatuqangit Records, 2021

Table 1. Inuit Qaujimajatuqangit Consent, 2021

Ref. no.	Consent Date	Title	Description	Address	Location	Projects	Subject categories
C-24379	06-21-2021	Phase 2 Meliadine Launch	“Berry picking” best from Km 12 to Km 27 – dust is a problem. One woman has a cabin near the tent at Km 15 – her cabin location is located at a good berry picking spot away from the dust. Dust along AWAR.	AWAR from KM 12 to KM 27	Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Respect for the land, animals and the environment
C-24380	06-21-2021	Phase 2 Meliadine Launch	“Discovery” at Itiqlak is close to cabins	Discovery	Rankin Inlet, NU, CA (City)	Meliadine Extension	
C-24381	06-21-2021	Phase 2 Meliadine Launch	Fish have different sizes depending on the size of rocks in the streams and location; they change depending		Rankin Inlet, NU, CA (City)	Meliadine Extension	
C-24382	06-21-2021	Phase 2 Meliadine Launch	Used to walk from Rankin to area near Dianne river to fish way back	Dianne River	Rankin Inlet, NU, CA (City)	Meliadine Extension	
C-24392	03-30-2021	Approved Project and Virtual Meeting Room - Elders’ Group	When the water becomes dirty, fish move somewhere else.			Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24393	03-30-2021	Approved Project and Virtual Meeting Room - Elders’ Group	We [meeting participants] did not disturb fish climbing upstream in the past. There are too many disturbances from people and from the mine.			Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24394	03-30-2021	Approved Project and Virtual Meeting Room - Elders’ Group	The site was named after Bob Hickes. His Inuit name was Apualuktut, and that’s the fall’s local name. Apualuktut means “red hair” (Hickes was non-inuit). There is many char at this location. Char had difficulty going up (upstream) in the past (quite a few years ago). The falls resemble a fountain.The cliff is an obstacle.There is a big lake up (upstream) from Pistol Bay Falls that is used for fish derbies.	Pistol Bay Falls		Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24395	03-30-2021	Approved Project and Virtual Meeting Room - Elders’ Group	A meeting participant said her sister camps at this location every year. This site is used for many things, including survival. Travel occurs to Josephine Falls [and everywhere else] by snow machine and by ATV. In the past, people walked or used dog sleds. Community residents travel to these sites by ocean, using kayaks and canoes. Fox skins were used in boat construction.	Josephine Falls		Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24396	03-30-2021	Approved Project and Virtual Meeting Room - Elders’ Group	There are a lot of fish at landing lake. There is 1st Landing Lake and 2nd Landing Lake. It’s called Landing Lake because float planes landed (and land) there. Fish species at this site include: Trout; Arctic char; and Landlocked char (half breed fish, does not go down (downstream)). Meeting participants called Landlocked char the beauty and the beast fish.	Josephine Falls		Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24403	03-30-2021	Approved Project and Virtual Meeting Room – Elder Women	Land locked char, fish that resembles an eel (the liver is a delicacy and the meat makes a good broth), white fish (that do not go up/downstream), grayling.	Nellie's house	Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment

Table 1. Inuit Qaujimajatuqangit Consent, 2021

Ref. no.	Consent Date	Title	Description	Address	Location	Projects	Subject categories
C-24404	03-30-2021	Approved Project and Virtual Meeting Room – Elder Women	The community fish using fishnets, and they have seen different species of fish they have not seen before.		Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24405	03-30-2021	Approved Project and Virtual Meeting Room – Elder Women	Some years are dry, and the water is low. Some years, the water is high when there is more rain		Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24406	03-30-2021	Approved Project and Virtual Meeting Room – Elder Women	The food fish eat affects the colour of their flesh. As Arctic char go up (upstream), they lose their red colour, as they stop eating shrimp.		Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24407	03-30-2021	Approved Project and Virtual Meeting Room – Elder Women	All fish at Meliadine go up (upstream) to Peter Lake, and then go down (downstream) to the ocean via Diane River.		Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24411	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	Today, believes AEM should know that Inuit learn quickly by watching and being told how to work with equipment. Elders learn by seeing.		Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24412	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	Told about the story of her father who did some prospection at Meliadine Lake. She is not surprised that AEM found more gold because her father gave her books about the history of prospection in that area. Her father told her she was to be the guardian of that book that contained information on local exploration. Levenia feels that holding this book is a big responsibility and she does not know how to ensure its safekeeping for the future. She is happy to be part of this Elders' Katimayit (Committee)	Meliadine Lake	Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Decision making through discussion and consensus Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24413	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	Harry explained that mining has impacted marine mammals at Chesterfield	Chesterfield Inlet	Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Decision making through discussion and consensus Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect and relationships
C-24414	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	Used to pick berries all the way up to Meliadine Lake. Used to walk from Rankin to area near Diane River and walk back. It was spring so it was light all day long. Rosie added it is now too dusty to pick berries along the AWAR	Meliadine Lake and AWAR	Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Decision making through discussion and consensus Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24415	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	Women did and still do most of the fishing in the communities.		Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Decision making through discussion and consensus Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment

Table 1. Inuit Qaujimajatuqangit Consent, 2021

Ref. no.	Consent Date	Title	Description	Address	Location	Projects	Subject categories
C-24416	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	Need to think about the future of our grandchildren. In Arviat, there are so many young ones with no future and they are just hanging around. They need something to work on, to stay with their education. Mines are giving "us" a chance to give a future to our young ones. We are now getting on with age and it is up to make sure our grandchildren have something to look forward to. This Katimayit is good because I feel we will know more about the future so we can talk to our children and let them know why it is good to stay in school.Times are changing and we must learn to adapt too		Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Decision making through discussion and consensus Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24417	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	People pick berries from Km 12 and it is a shame that those berries are full of dust now	AWAR	Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Decision making through discussion and consensus Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24418	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	The seasons are changing and the streams are getting lower. That is impacting fish also.		Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Decision making through discussion and consensus Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment
C-24419	06-18-2021	AEM Inuit Elders' Advisory Group – Kick Off	I used to walk from Rankin Inlet to over Diane River to fish on various lakes in that area. Would take me all day.	Diane River	Rankin Inlet, NU, CA (City)	Meliadine Extension	Societal Values - Decision making through discussion and consensus Societal Values - Fostering good spirit by being welcoming and inclusive Societal Values - Respect for the land, animals and the environment

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23113	2021-06-22	From VMR: We heard from the community that Inuit caribou hunting is an important activity. People from Rankin Inlet hunt caribou in the Meliadine area and elsewhere. They also hunt along the coast by boat (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015). Is this statement accurate? 3x Yes Do you or people you know hunt caribou here? 2x Yes What is the size of a typical harvest? 1x 10-25 1x 1 to 3 What parts of the caribou do you eat? 3x All How often do you eat caribou? 1x 3 to 4 weeks 1x when available 1x sometimes What is a typical portion size? 1x fist size 1x 1-2 serving size How is the meat prepared? 1x Raw,Fried 1x Dried,Other 1x by,hand,with,ulu	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	IQ studies in Rankin Inlet, Chesterfield Inlet, and Whale Cove, it was apparent that Inuit caribou hunting is by far the most important (and most treasured) activity in this area. The IQ information found that caribou hunting occurs whenever the migrations of the caribou bring them within boat, Honda (ATV), or snowmobile reach of any of the three communities. The people from Chesterfield Inlet tend to hunt to the north and west of the community along the inlet of the same name, and some hunt south toward Rankin and the Project. People from Rankin Inlet hunt to the northwest, and west beyond the Project, and to the southwest. They also hunt along the coast by boat. Those from Whale Cove hunt along the coast and into Corbett Inlet and Pistol Bay, and inland, but seldom go in the area of the Meliadine Project.	OLD_LOCATION_PROPOSAL: Rankin Inlet; Chesterfield Inlet; Whale Cove	Kivalliq, CA (State / Province)	Meliadine Extension
C-23124	2021-06-22	From VMR: We learned from the community that fishing for both Arctic char and grayling are important to people. There are remains of stone fishing weirs near the mouth of the Meliadine River, and stone drying racks scattered through the valley. ""Iqalugaarjuk"" translates as ""the river of little fishes,"" which refers to the grayling. Rectangular stone ""caches"" were used to store frozen char for winter use (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015)." "Is this statement accurate? 3x Yes" "Do you or people you know fish here? 3x Yes" "How often do you fish here? Bi-annually Sometimes" "What fish do you usually catch? Grayling" "How big are the fish that you normally catch here? 10 inches"	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	Fishing for both char and arctic grayling was important to people. There are remnants of stone fishing weirs near the mouth of the Meliadine River, and stone drying racks scattered through the valley. “Iqalugaarjuk” translates as “the river of little fishes,” which refers to the grayling. Rectangular stone “caches” were used to store frozen char for winter use. Meliadine and Char rivers are still considered good fishing sites today. Lake trout are often caught in Landing Lake, at the outlet to the Char River, while this short river itself offers good grayling fishing, and char fishing during the char runs.	OLD_LOCATION_PROPOSAL: Meliadine River	Meliadine River, Kivalliq, CA (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23124	2021-06-22	"How often do you eat fish that you/someone you know caught here? When caught" "How do you cook the fish? Fried Boil" "What parts of the fish do you eat? Meat All" "TLU_Description We learned from the community that Meliadine and Char rivers are considered good fishing sites today. Lake trout are often caught in Landing Lake, at the outlet to the Char River. The river has good grayling fishing, and char fishing during the char runs (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015)." "Is this statement accurate? 2x Yes" "Do you or people you know fish here? 2x Yes" "How big are the fish that you normally catch here? Not sure" "How often do you eat fish that you/someone you know caught here? Sometimes" "How do you cook the fish? Fried Boil" "What parts of the fish do you eat? All parts" "Has the fish habitat here changed over time? It changed"	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	Fishing for both char and arctic grayling was important to people. There are remnants of stone fishing weirs near the mouth of the Meliadine River, and stone drying racks scattered through the valley. “Iqalugaarjuk” translates as “the river of little fishes,” which refers to the grayling. Rectangular stone “caches” were used to store frozen char for winter use. Meliadine and Char rivers are still considered good fishing sites today. Lake trout are often caught in Landing Lake, at the outlet to the Char River, while this short river itself offers good grayling fishing, and char fishing during the char runs.	OLD_LOCATION_PROPOSAL: Meliadine River	Meliadine River, Kivalliq, CA (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23125	2021-06-22	From VMR: We heard from community consultation that the lower Meliadine was an important caribou hunting area. We learned that the herds migrated along the coast. Sometimes, large herds migrate through the area and many people hunt when caribou are present (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015). Is this statement accurate? 2x Yes Do you or people you know hunt caribou here? 2x Yes What is the size of a typical harvest? 10-25 lots What parts of the caribou do you eat? 2x All How often do you eat caribou? 3 to 4 weeks sometimes What is a typical portion size? Fist Size How is the meat prepared? frozen,baked,aged, raw, dried, fried, hand with ulu	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	The lower Meliadine was an important caribou hunting area when the herds migrated along the coast. There are numerous taluit (hunting hides) in the valley (Attachment B, Photo 3). These concealed hunters from the migrating caribou so they could take animals with bows and arrows, and later, with rifles obtained from the traders. Periodically, large herds migrate through the area and many people hunt when caribou are present. This was particularly true in the summer of 2011 when a large herd of caribou passed through the Meliadine area in early August. Inuit are allowed to hunt caribou at any time, but others must wait until August 15th and must obtain tags in order to hunt. During the 2011 migration, many people were hunting caribou throughout the park and along the slopes on the far side of the river, as well as anywhere that caribou were to be found within Honda reach.	OLD_LOCATION_PROPOSAL: Lower Meliadine	Lower Meliadine, Kivalliq, CA (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23129	2021-06-22	From VMR: We heard from the community that thousands of snow geese, Canada geese, and white-fronted geese stop in the lower Meliadine lakes to rest and feed during both spring and fall migrations. People hunted there in the past and continue to do so now. Many still use the old taluit as blinds (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015). Is this statement accurate? 4x Yes 1x No Do you or people you know hunt geese here? 4x Yes 1x No What is the size of a typical harvest? 1x 20-200 1x only catch as needed How many times a year do you typically hunt geese? 1x 1 1x 0 What parts of the geese do you eat? 1x all 1x everthing except bone and guts How often to you eat geese? 1x year round 1x barely 1x harvest every spring What is a typical portion size? 1x 1/4 goose How is the meat prepared? 1x boiled,or,baked 1x cooked	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	Some of the taluit likely did double duty as hunting blinds for geese, other waterfowl, or sandhill cranes. Thousands of snow geese, Canada geese, and white-fronted geese stop in the lower Meliadine area to rest and feed during both spring and fall migrations. People hunted there in the past and continue to do so now. Many still use the old taluit as blinds, as evidenced by the large quantities of shotgun shell casings, .22 calibre bullet holders, and general plastic litter in the structures.	OLD_LOCATION_PROPOSAL: Lower Meliadine	Lower Meliadine, Kivalliq, CA (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23135	2021-06-22	From VMR: We heard from the community that caribou are important. Consultation told us that there are caribou bones on the land, some grown into the moss of the tundra. We heard that this area still is a major caribou hunting area. Caribou, including many cows and calves, migrate through this area (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015). Is this statement accurate? 1x yes Do you or people you know hunt caribou here? 1x yes What is the size of a typical harvest? 1x 10-25 1x 1 to 3 What parts of the caribou do you eat? 3x all How often do you eat caribou? 1x 3 to 4 weeks 1x when available 1x sometimes What is a typical portion size? 1x fist size 1x 1-2 serving size How is the meat prepared? 1x Raw,Fried 1x Dried,Other 1x by,hand,with,ulu	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	From the number of caribou bones on the land and even incorporated into the moss of the tundra, it is clear that this area has been and is a major caribou hunting area. Caribou, including many cows and calves, migrated through this area in early August, 2011 (Attachment B, Photo 14) in large numbers and were hunted throughout the lower Meliadine River Valley and on the slopes of this section of the road.	OLD_LOCATION_PROPOSAL: Lower Meliadine River	Lower Meliadine River, Kivalliq, CA (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23145	2021-06-22	From VMR: We learned from community consultation that people tend to pick berries in Iqalugaarjuup Nunanga Territorial Park, near Second Landing Lake, and along the Diane River Trail. Sometimes, people cross the river to pick berries, mostly while hunting caribou or geese (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015). Is this statement accurate? 4x Yes Do you or people you know pick berries here? 4x Yes Are these the berries that are picked here? 1x Blackberry,Crowberry,Blueberry,Ligonberry,Cloudberry,Bearberry How often do you eat berries from the land? When they grow up until winter time year round What is a typical portion size that you eat of the berries? Same as black berries 1 cup a lot, what's available as much as possible Are these berries used for medicine? 1x yes 2x no	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	Berry-picking is practiced by families, including grandparents and children, anywhere the berry areas are accessible from Rankin Inlet by Honda (ATV). People are less likely to cross the Meliadine River to pick berries, especially if they are carrying young children on their Hondas (ATVs). People tend to pick berries in Iqalugaarjuup Nunanga Territorial Park, near Second Landing Lake, and along the Diane River Trail. A few people do cross the river to pick berries, mostly in conjunction with hunting of caribou or geese. It is evident that a bridge across the Meliadine River would make far more good berry-picking areas accessible to families. This has been mentioned in several interviews and focus groups.	OLD_LOCATION_PROPOSAL: Rankin Inlet; Iqalugaarjuup Nunanga Territorial Park; Second Landing Lake; Diane River Trail; Meliadine River	Kivalliq, CA (State / Province)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23148	2021-06-22	From VMR: We heard from the community that Meliadine Lake is a good fishing spot in the late winter and springtime. Many people follow the winter road toward the Meliadine Camp and then follow snowmobile trails to the southeast end of the lake. There are many ice fishing holes made in Meliadine Lake in the spring (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015). Is this statement accurate? 5x Yes 0x No Do you or people you know fish here? 5x Yes 0x No How often do you fish here? 1x bi-annually 1x not at all, I don't fish there 1x 4 seasons 1x spring What fish do you usually catch? 1x Arctic Char How big are the fish that you normally catch here? 1x 20 inches 1x they are different in size How often do you eat fish that you/someone you know caught here? 1x When caught 1x Regular Diet How do you cook the fish? 2x Fried 2x Boiled What parts of the fish do you eat? 1x meats, head 2x all except bones From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	Meliadine Lake was mentioned in all focus groups held in Rankin, as it is a popular fishing location in the late winter and springtime, and a good hunting spot whenever caribou are in the area. Many people follow the winter road toward the Meliadine Camp and then follow snowmobile trails to the southeast end of the lake. There are many ice fishing holes made in Meliadine Lake in the spring. Kivalliq Counselling and Support Services holds family fishing events at Meliadine Lake (Attachment B, Photos 29 and 30), and it is a popular fishing spot during the fishing derby. Some people commented that they appreciate the idea of Agnico-Eagle putting in a spur road and boat ramp/dock at the southeast end of Meliadine Lake, as they will be able to get boats out to the lake once there is a road.	OLD_LOCATION_PROPOSAL: Meliadine Lake	Meliadine Lake, Kivalliq, CA (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23149	2021-06-22	"TLU_Description We heard from the community that Meliadine Lake is a good fishing spot in the late winter and springtime. Many people follow the winter road toward the Meliadine Camp and then follow snowmobile trails to the southeast end of the lake. There are many ice fishing holes made in Meliadine Lake in the spring (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015)." "Is this statement accurate? 5x Yes" "Do you or people you know fish here? 5x Yes" "How often do you fish here? bi-annually not at all, I don't fish there 4 seasons Spring" "What fish do you usually catch? Artic Char" "How big are the fish that you normally catch here? 20 inches They are different in size" "How often do you eat fish that you/someone you know caught here? When Caught Regular Diet" "How do you cook the fish? Fried Boil" "What parts of the fish do you eat? Meat Head All except bones" From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	Consultations also revealed that many people are concerned about the health of Meliadine Lake. Several comments were made about gravel being removed from islands in the lake, and those expressing concern about this further indicated that birds nest on those islands. Additionally, people also use the islands while hunting caribou. People further indicated that they were concerned about fish populations in Meliadine Lake; asking if the fish would be affected by the tailings ponds or potential sewage runoff. Some were under the impression that Meliadine Lake or part of it would be drained and the fish moved. The researchers undertaking IQ studies tried to correct this perception, and were under the impression that the community understood this clarification.	OLD_LOCATION_PROPOSAL: Meliadine Lake	Meliadine Lake, Kivalliq, CA (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23150	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	The Meliadine Lake area is also good for hunting geese and other waterfowl in the fall. Every ridge and slope also offers good berry-picking. There is likely little berry picking done here now except when families are camped on the land, but the presence of a road would make this much more accessible to those who wish to pick berries.	OLD_LOCATION_PROPOSAL: Meliadine Lake	Meliadine Lake, Kivalliq, CA (Sublocality)	Meliadine Extension
C-23156	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	During the focus groups, the HTO members expressed some concerns about fish. They had heard that some lakes would be drained and fish harvested or moved to another lake. There was some concern about this, until it was explained that only small lakes would be drained, and that Meliadine Lake was not to be disturbed.	OLD_LOCATION_PROPOSAL: Meliadine Lake	Meliadine Lake, Kivalliq, CA (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23167	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove" - Appendix 9.3-A	Elders mentioned that the mining activities may affect some fishing areas, especially those in Meliadine Lake. There was concern about the potential for islands in Meliadine Lake being used to supply gravel. Elders said they would be very opposed to that, and quite concerned about the effect of gravel quarrying on sedimentation and fish in the lake. The elders emphasized that Meliadine Lake is a very popular fishing spot, and any damage to the water or fish would elicit a lot of concern.	OLD_LOCATION_PROPOSAL: Meliadine Lake	Meliadine Lake, Kivalliq, CA (Sublocality)	Meliadine Extension
C-23227	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Public Engagement and Consultation Baseline Report" - SD 3-1	The mine should not adversely impact Meliadine Lake and mitigate any archaeological sites to be disturbed	OLD_LOCATION_PROPOSAL: Kivalliq	Kivalliq, CA (State / Province)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23231	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Public Engagement and Consultation Baseline Report" - SD 3-1	The community did not want the TSF or WRSF close to Meliadine Lake for fear of impacting the lake	OLD_LOCATION_PROPOSAL: Meliadine Lake	Meliadine Lake, Kivalliq, CA (Sublocality)	Meliadine Extension
C-23234	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Public Engagement and Consultation Baseline Report" - SD 3-1	Meliadine Lake during the summer to access cottages, camps and to go fishing and hunting	OLD_LOCATION_PROPOSAL: Kivalliq	Kivalliq, CA (State / Province)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23257	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Public Engagement and Consultation Baseline Report" - SD 3-1	Meliadine Lake and the Meliadine River could be at risk of contamination in the event of a disaster or bad practice at the mine. This would jeopardise the water quality and fish in the Meliadine watershed.	OLD_LOCATION_PROPOSAL: Kivalliq	Kivalliq, CA (State / Province)	Meliadine Extension
C-23269	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Public Engagement and Consultation Baseline Report" - SD 3-1	Comments on the freshwater aquatic environment largely revolved around the fish in the small ponds to be lost during mining and what is to be done with them, and the need to protect the traditional use of fish from Meliadine Lake.	OLD_LOCATION_PROPOSAL: Meliadine Lake	Meliadine Lake, Kivalliq, CA (Sublocality)	Meliadine Extension
C-23327	2021-06-22	From VMR We heard from community consultation that Meliadine Lake is an important area (Elder's Group Meeting, March 2021). Is this statement accurate? 4x Yes Do you use Meliadine Lake or any of the lakes in this area for swimming or recreational activities? 3x Yes 1x No Which recreational activities do you do in this area? ATVing,Camping,Hiking, Skidooing,to,gather,with,family,and,friends Are there any areas in this area that you avoid? 1x Yes, not to get too close to the grave sites 1x Not Sure 1x Mine Site	04-01-2014	"Public Engagement and Consultation Baseline Report" - SD 3-1	There are small lakes around the Meliadine Lake area. There are small lakes which are being dewatered. I don't want the water put back into Meliadine Lake. I would rather see the water transferred away so that Meliadine Lake doesn't become contaminated with the mine water.	OLD_LOCATION_PROPOSAL: Meliadine	Meliadine (Sublocality)	Meliadine Extension

Table 2. Inuit Qaujimajatuqangit Validated, 2021

Ref. no.	Validation Date	Feedback / Answers	Consent Date	Title	Description	Address	Location	Projects
C-23338	2021-06-22	From VMR: We learned from the community that Lingonberry grows almost everywhere on the tundra around Rankin Inlet. It has red berries that ripen in August, and are food to humans and wildlife. The berries are eaten by geese, ptarmigan, gulls, sik siks, foxes, and bears. The berries are eaten in the fall and in the spring, after spending the winter under the snow (Results of Inuit Qaujimajatuqangit interviews and focus groups held in Rankin Inlet, Chesterfield Inlet and Whale Cove for the FEIS 2015). Is this statement accurate? 4x Yes Do you or people you know pick Lingonberries here? 3x Yes 1x No How often do you eat Lingonberries? 1x When they grow, summer through fall 1x bi-weekly 2x sometime What is a typical portion size that you eat of the berries? 1x There are quite a few, cloud, black, blue and red berries. Are all editable 1x 1 cup 2x some Are these berries used for medicine? 1x yes 3x No	04-01-2014	"Inuit Qaujimajatuqangit Traditional Ecological Knowledge of Plant Use: Summary Report, Elders' Workshop in Rankin Inlet" - Appendix 9.3-B	(lingonberry) This small heath grows nearly everywhere on the tundra around Rankin Inlet, mixed in with hair lichen on the crests of the eskers, with other heaths on the slopes, and on the sides of the hummocks and tussocks in the edges of the wetlands, even as small mats on polished bedrock when it can find a place to root. The only place it is not found is in the sedge marshes. It produces beautiful red berries that ripen in August, and are food to many species of wildlife, and to humans, of course. The berries are eaten by geese, ptarmigan, gulls, sik siks, foxes, bears, and man, of course. They are eaten in the fall in which they form, and again after spending the winter under the snow. At that point, they are deep burgundy in colour, and taste very sweet, sometimes lightly fermented.	OLD_LOCATION_PROPOSAL: Rankin Inlet	Rankin Inlet, NU, CA (City)	Meliadine Extension

APPENDIX B

Non-Native & Invasive Species in Nunavut

Non-Native & Invasive species *In Nunavut*

In 2010 the Canadian Endangered Species Conservation Council (CESCC) identified 17 species not normally found in Nunavut.

These are called "non-native species". Some of these plants and animals can become an "invasive species", which represents a potential major concern for the future health of the Arctic.

What is a non-native species?

A non-native species is defined as an organism that is not normally found in a region. They are introduced by human activities, which can be intentional (e.g. species introduced to control a pest species), accidental (e.g. shipping and ballast water exchange), or environmental (e.g. changes in climate leading to wildlife movements). An example of a non-native species in Nunavut is the European Starling *(Sturnus vulgaris)*, which was introduced to North America from Europe intentionally by humans.

What is an invasive species?

Not all non-native species are considered invasive. This term is reserved for species that do so well in their new habitat that they end up causing harm to the environment, other species, human health, or economic activity (ISAC, 2006). An example of an invasive species in southern Canada is the Zebra Mussel *(Dreissena polymorpha)*, which was introduced to North America by ships releasing their ballast water. The Zebra mussel reproduces quickly and establishes large colonies on any hard surface. In this way they take over habitat occupied by native species, reducing the availability of food for other species, and also attaching themselves in great numbers to boats and other infrastructure in the water. (Benson and Raikow, 2010).

Why should you be concerned about invasive species?

When invasive species are introduced and survive, their populations can increase rapidly because there are no natural predators. Invasive species may feed on native species, compete for food and space, as well as expose native species to new parasites and disease. Invasive species are now widely recognized as a leading cause of endangerment and/or extinction of native species (Lassuy and Lewis, 2010).

* *There are currently no known species in Nunavut that can be classified as aquatic or terrestrial invasive species.*

Sokol 2005

Species: Field Sow Thistle *(Sonchus arvensis)*

Impact: The Field Sow Thistle grows quickly, easily and when there are many of them they can reduce the water resources available to other plants. They have the potential to decrease native plant diversity by competing for space and water.

Introduction pathway: Accidently introduced from Europe into North America in a containment of agricultural crop seed. This plant has been able to spread long distances across Canada because the seeds can travel far in the wind.

Sokol 2005

Species: The European Starling *(Sturnus vulgaris)*

Impact: The European Starling can displace native bird species by taking over nesting sites and competing for food.

Introduction pathway: Introduced intentionally to North America from Europe. These birds then dispersed naturally into Canada through migration.

How might invasive species get into Nunavut?

Species are transported throughout the world by human activities, like shipping, which allows species to move further distances and over barriers that they could not do on their own. Nunavut remains very remote compared to the rest of Canada and so the lack of major road systems, infrequent shipping and cold climate has limited their introduction and survival.

However, as climate change alters Arctic ecosystems, it creates conditions that are more favorable to the survival and reproduction of non-native species. It also enables greater human activity and development, which gives potential invasive species more opportunities to establish themselves. (Lassuy and Lewis, 2010).

Pathways of introduction for invasive species into Nunavut

MacGregor 2009

Hull fouling occurs when organisms attach themselves to the outside of a ship's hull where they can then be transported around the world.

* Ballast water exchange and hull fouling have the greatest potential for introducing invasive species into the aquatic ecosystems of Nunavut. Ballast water is used to stabilize ships. It is pumped aboard ships from different ports around the world and often exchanged far from the region it was obtained. This water can contain species that are not native, and may establish themselves locally.

* Seeds, insects and even small mammals can be transported around the world through the shipping of grocery produce, lumber, construction supplies, and packing materials, even dirt from someone's footwear can contain plant seeds (IASC, 2010).

Dorchet 2012

The Migratory Grasshopper *(Melanoplus sanguinipes)* is a winged insect that is widely distributed across Canada and is one example of a species that may expand its range into Nunavut.

* As climate continues to change in the Arctic, many terrestrial and aquatic plants and animals will move further north looking for the food and habitat they desire. These wildlife movements are not a threat when it comes to invasive species, but it is important to note that some species, (especially rare or threatened ones) may not survive the transition. Others may do well, like flying insects, which are already increasing in number in some areas of Nunavut. (IASC, 2010).

Wildlife movements are often referred to as "range extensions" where a species expands the area they can live in when the habitat and climate is favorable for them.

How can you help?

Report

Have you seen a different plant, animal or insect in Nunavut?

You help identifying these species is important. Report the **location** where you observed the species (GPS Coordinates are very helpful) and provide a **detailed description** of the plant, animal, or insect. If possible **take a photo**.

Remember that not all non-native species are considered invasive. If you see an unknown plant or animal, it is very important to report it.

Do not take any extreme actions; the first step is reporting the species so that territorial and federal agencies can respond appropriately. We will report our findings back to you and information about the species you have observed.

Share

Keep yourself informed and educate others about non-native and invasive species. Let them know what to do if they see an unknown or uncommon species.

Report a species to your local Conservation Officer.

For More Information or if your CO is not available please contact:

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Environment Canada / Environnement Canada

Non-Native Species in Nunavut

As of 2011, there are 17 species known to be non-native in Nunavut, these are listed below and are all terrestrial species. Please note that it is not currently known what the potential is for any of these species to become invasive and to what extent. Two species, the starling and the sow thistle are described in more detail below.

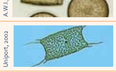
SCIENTIFIC NAME	COMMON NAME		ORGANISM TYPE
Carum carvi	**Wild Caraway**	Elvik, 2003	Flowering Plant
Taraxacum officinale	**Common Dandelion**	Elvik, 2003	Flowering Plant
Sonchus arvensis	**Field Sow Thistle**	Sokol, 2005	Flowering Plant
Leucanthemum vulgare	**Oxeye Daisy**	Brouwer, 2009	Flowering Plant
Thlaspi arvense	**Field Pennycress**	Brouwer, 2009	Flowering Plant
Capsella bursa-pastoris	**Shepherd's Purse**	Gray Herbs, 2009	Flowering Plant
Barbarea vulgaris	**Yellow Rocket**	Mitich, 2009	Flowering Plant
Amaranthus retroflexus	**Green Amaranth**	Elpel, 2009	Flowering Plant
Hordeum vulgare	**Common Barley**	Mitich, 2009	Flowering Plant
Puccinellia distans	**Spreading Alkali Grass**	Elpel, 2009	Flowering Plant
Vicia cracca	**Tufted Vetch**	Elpel, 2009	Flowering Plant
Papaver somniferum	**Opium Poppy**	Anderson, 2009	Flowering Plant
Plantago major	**Common Plantain**	Elpel, 2009	Flowering Plant
Polygonum aviculare	**Prostrate Knotweed**	Elpel, 2009	Flowering Plant
Pieris rapae	**Cabbage White**	Hall & Jason	Butterfly
Sturnus vulgaris	**European Starling**	Sokol, 2005	Passerine Bird
Passer domesticus	**House Sparrow**	Murphy, 2009	Passerine Bird

*Species photo references available upon request. Images are not to scale.

Potential Invasive Species in Nunavut

As trade and shipping continues to increase, some aquatic invasive species known to commonly foul ship hulls and ballast waters, like the Chinese Mitten Crab, are more likely to arrive at ports around Nunavut.

A recent report commissioned by Fisheries and Oceans Canada identified a number of potential aquatic invasive species, mainly for the Hudson Bay region. The table below lists only those species considered as "High Risk" to Nunavut and they are found in freshwater & marine environments.

SCIENTIFIC NAME	COMMON NAME		ORGANISM TYPE
Osmerus mordax	**Rainbow Smelt**	NOAA.GOV	Fish
Gymnocephalus cernuus	**Ruffe**	Elpel, 2009	Fish
Caprella mutica	**Skeleton Shrimp**	Pinkerneil at wiki	Crustacean
Chelicorophium curvispinum	Data unavailable	Invasi.pl.pl	Crustacean
Dikerogammarus villosus	**Killer Shrimp**	Hillenbrand, 2005	Crustacean
Gmelinoides fasciatus	Data unavailable	photolight.ru	Crustacean
Pontogammarus robustoides	Data unavailable	biodiversity.org	Crustacean
Eriocheir sinensis	**Chinese Mitten Crab**	Elpel, 2009	Crustacean
Hemimysis anomala	Data unavailable	Pinkerneil, 2007	Crustacean
Balanus improvisus	**Acorn Barnacle**	Elpel, 2009	Crustacean
Corbicula fluminea	**Asian Clam**	Mahdeli, 2005	Mollusc
Dreissena bugensi	**Quagga Mussel**	CWDI.org	Mollusc
Bythotrephes longimanus	**Spiny Water Flea**	Mirth, 2005	Zooplankton
Cercopagis pengo	**Fishhook Water Flea**	Hebert & Mill	Zooplankton
Eubosmina maritima	Data unavailable	invasivesnorth.ca	Zooplankton
Marenzelleria cf. viridis	Data unavailable	NOAA.GOV	Worm
Marenzelleria cf. wireni	Data unavailable	greenspace.org	Worm
Cordylophora caspia	**Freshwater Hydroid**	Cohen, 2005	Hydrozoa
Coscinodiscus wailesii	Data unavailable	 A.M.V., 2006	Phytoplankton
Odontella sinensi	Data unavailable	Unspec, 2000	Phytoplankton
Prorocentrum minimum	Data unavailable	Hallfors, 2004	Phytoplankton
Codium fragile ssp. tomentosoides	**Oyster Thief**	Erickson, M.D.	Algae
Glugea hertwigi	Data unavailable	Kilgallen, K.	Protozoa
Amphilina foliacea	Data unavailable	Mackenzie & Longshaw, 2003	Parasite

*Species photo references available upon request. Images are not to scale.

APPENDIX C

Bird Species Detected Incidentally During Point Count Surveys

Table B1: Species Incidentally Reported During Point Count Surveys Along AWAR, 2018-2021

Common Name	Scientific Name	Total Number of Individuals Observed[a]			
		2018	2019	2020	2021
cackling goose	*Branta hutchinsii*	2	5	15	25
Canada goose	*Branta canadensis*	34	53	2	41
common loon	*Gavia immer*	1			
common raven	*Corvus corax*				1
greater white-fronted goose	*Anser albifrons*	6	8		2
green-winged teal	*Anas carolinensis*		1		
herring gull	*Larus argentatus*	5	3		17
least sandpiper	*Calidris minutilla*	1		2	4
long-tailed duck	*Clangula hyemalis*	3	5	2	7
northern pintail	*Anas acuta*	2	2		
northern shoveler	*Spatula clypeata*		2		
pacific loon	*Gavia pacifica*	3	4		10
peregrine falcon	*Falco peregrinus*	1			1
red-breasted merganser	*Mergus serrator*	2	3		
red-throated loon	*Gavia stellata*	1	2		
Ross's goose	*Chen rossii*	2			
rough-legged hawk	*Buteo lagopus*		1		
sandhill crane	*Grus canadensis*	13	25	8	28
semipalmated plover	*Charadrius semipalmatus*	1	5	2	
snow goose	*Chen caerulescens*	81			1
tundra swan	*Cygnus columbianus*			1	4
willow ptarmigan	*Lagopus lagopus*	4	2	1	1

a) Includes flyovers, non-songbirds, and incidental observations >100m from observer

APPENDIX D

All Weather Access Road and Rankin Inlet Road Bypass Den Survey

MELIADINE MINE

All-Weather Access Road and Rankin Inlet Bypass Road - 2021 Den Survey

Prepared by:
Agnico Eagle Mines Limited – Meliadine Division
December 2021

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2 Den Survey Methodology 1
3 Results and Discussion 2

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Appendix A- Den photos

Appendix B- Meliadine Carnivore Den Survey area

1 Background

This summary report is prepared in accordance with NIRB Project Certificate 006 issued by the Nunavut Impact Review Board (NIRB), condition 53:

> *Prior to construction of Project infrastructure and Phase 2 of the all-weather access road, the Proponent shall conduct a survey that is sufficient to locate any dens of foxes, bears or wolverines that could be damaged or destroyed during construction or operation of the Project.*

In addition, Section 2.3 of the Terrestrial Environment Management and Monitoring Plan (TEMMP, Agnico Eagle 2020) has monitoring conditions related to den surveys.

In 2021, den survey monitoring was completed in areas around Meliadine Mine where disturbance was likely to occur due to construction and operations.

This report summarizes the 2021 den survey methodology, results and discussion.

2 Den Survey Methodology

The 2021 den survey's objective was to locate carnivore dens. Carnivore abundance in these areas is relatively low and includes the following species:

- Arctic Fox
- Arctic Wolves
- Polar Bears
- Grizzly Bears
- American Marten
- Wolverine

The most abundant carnivore species occurring around the mine site is the Arctic Fox followed by the American Marten. Polar Bears are occasionally observed while Grizzly Bears, Arctic Wolves and Wolverines are rarely observed in the area. Therefore, the focus of the survey was on Arctic Fox and American Marten dens.

The priority for den surveying includes areas of suitable habitat around the perimeter of the constructed site. These areas mainly consist of esker material used for industrial pads, and locations of fox observations reported by on-site staff. Photos taken during the survey are provided in Appendix A. The survey area around Meliadine Mine is illustrated in yellow on the aerial image of the site (Figure 1) in Appendix B.

Surveys are conducted by qualified Environmental Technicians with field experience and training provided by Agnico Eagle Environmental Coordinators.

Areas are searched on foot along the base of industrial pad slopes and natural slope ridges to ensure that all potential dens are located and inspected. When a den site is located it is inspected on foot to determine the status (i.e., inactive, active, pups present, etc.). Attention is paid to ensure all confirmed dens are from Arctic Foxes or Martens and not ground squirrels.

The survey was completed as soon as feasible following the snow melt and during summer.

3 Results and Discussion

Two carnivore dens were observed during the surveys conducted.

One Arctic fox den was observed approximately 375 m east of KM29 on the AWAR on July 5th, 2021. No photos are available for this den, since cubs were observed at the time of survey and it was not possible for the observer to get close.

One Arctic fox den was observed 1.3 km west of the Meliadine Mine on August 15th, 2021. Many entrances were observed, which may indicate that this den has been used by foxes for several years. This den is still active; a fox was observed going down one of the entrances at the time of the survey. Photos are included in Appendix A.

Appendix A

Arctic Fox Den Photos

Photo 1: Fox den west of the Meliadine site- 1.3km from site (August 15th, 2021)

Photo 2: Fox den west of the Meliadine site- 1.3km from site (August 15th, 2021)

Appendix B

Meliadine Carnivore Den Survey area

Figure 1: Meliadine Mine Carnivore Den Survey Area

Figure 2: July 5th and August 15th 2021 Fox dens

APPENDIX E

Meliadine Project Caribou Behaviour Study, 2021

AGNICO EAGLE

Meliadine Project

Caribou Behaviour Study, 2021

January 2022

Project No.: 0605387-2

The business of sustainability

ERM

January 2022

Meliadine Project

Caribou Behaviour Study, 2021

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EXECUTIVE SUMMARY

The Meliadine Mine (the Project), owned and operated by Agnico Eagle Mines Limited (Agnico Eagle), is located on Inuit Owned Land (IOL) approximately 25 km north of Rankin Inlet, Nunavut. A 34 km All Season Access Road (AWAR) connects the Project to Rankin Inlet. During June and July each year, groups of caribou from the Qamanirjuaq herd occur in the Project area, some crossing through the Project site and the AWAR.

As part of the Nunavut Impact Review Board (NIRB) Project Certificate #006, Agnico Eagle is required to study and report on effects of the Project on caribou behaviour (T&C 57, b.). The Agnico Eagle Terrestrial Environment Management and Monitoring Plan (TEMMP 2020) includes a behaviour monitoring program to i) determine if there are changes to behaviour with distance to the Project and ii) in response to disturbances such as passing vehicles.

During 2020, Agnico Eagle retained ERM to update the field protocols used for behaviour monitoring. ERM adapted standard methods for caribou behaviour monitoring developed by the Government of Northwest Territories Department of Environment and Natural Resources (GNWT ENR). Following the first year of data collection in 2020, the protocols were updated for the 2021 season to improve the quality of the data collected.

Field surveys were conducted during June and July 2021 by an ERM wildlife biologist and an Agnico Eagle environmental technician dedicated to behaviour monitoring. In addition, Project environmental technicians were trained in the updated method and conducted behaviour surveys on an opportunistic basis while conducting other duties. Each survey lasted 30 minutes, with scan samples conducted every three minutes.

The behaviour monitoring program in 2021 had several results:

- The standard monitoring protocols adapted from the GNWT ENR worked well at the Project site.
- Forty-six surveys were conducted with the majority of observations between June 29 and July 2. This was approximately one week earlier than peak caribou observations in 2020. The data from 2020 and 2021 were combined to reach the goal of 100 surveys across two years.
- Observations were well distributed across a range of caribou group sizes from 1 to 2 individuals to >1,000.
- Small groups of <50 caribou were observed both near (<300 m) and far (>300 m) from infrastructure while large groups (>50) occurred beyond 300 m from infrastructure. Small groups consistently had a higher proportion of response behaviours (running, alert) than larger groups. This was true in both 2020 and 2021.
- Groups of caribou were observed near the road in equal proportions on both the upstream and downstream sides of the road, but were more often observed further from the road on the downstream side of the road. Behaviour did not differ between caribou on the two sides.
- An analysis of the data across both years indicate a trend for caribou at greater distance from infrastructure (>300 m) to have a lower proportion of response behaviours. This analysis accounted for the difference in group size with distance, but should be interpreted with caution given the small sample size.
- The proportion of caribou with response behaviours in a group was unrelated to measured environmental variables including temperature and wind speed.

- Approximately half of the surveys included a disturbance event, typically from essential Project vehicles, mostly pickups, and all-terrain vehicles (ATVs) used by community members on the AWAR for travel and harvesting. The AWAR was closed to Project vehicles (with the exception of approved convoys) when caribou were near the road and all Project vehicles stop when caribou are on the road.
- Following a disturbance event, the proportion of response behaviours in a group of caribou rose, but typically returned to baseline behaviours within two sampling periods (six minutes).

The updates applied to the survey protocol in 2021 used feedback from the first year of data and analysis, and were helpful in improving the overall quality and accuracy of the data. Interestingly, even with these changes, the trends in the results were consistent between the two years of data. Caribou close to the road and in smaller groups typically had higher overall levels of response behaviour. Following a vehicle disturbance, caribou response behaviour tended to spike and return to background levels within ~6 minutes.

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ACRONYMS AND ABBREVIATIONS

Agnico Eagle	Agnico Eagle Mines Ltd.
AIC	Akaike information criterion
ATV	All-Terrain Vehicle
AWAR	Meliadine Mine All Weather Access Road
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
BQCMB	Beverly Qamanirjuaq Caribou Management Board
GLMs	Generalized linear models
GN	Government of Nunavut
GNWT ENR	Government of Northwest Territories Department of Environment and Natural Resources
IOL	Inuit Owned Land
KivIA	Kivalliq Inuit Association
km	Kilometre
km/hr	Speed expressed as kilometer per hour
m	Metre
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
NWT	Northwest Territories
T&C	Terms and Conditions
TEMMP	Terrestrial Environment Management and Monitoring Plan
the Project	The Meliadine Mine

1. PROJECT OVERVIEW

The Meliadine Mine (the Project), owned and operated by Agnico Eagle Mines Limited (Agnico Eagle), is located on Inuit Owned Land (IOL) approximately 25 km north of Rankin Inlet, Nunavut. A 34 km all weather access road (AWAR) connects the Project to Rankin Inlet. A bypass road was constructed to the west and south of Rankin Inlet to allow mine traffic to circumvent the hamlet when traveling from the AWAR to the Project marine laydown (Figure 1-1).

The Meliadine Mine was approved with a life of mine plan that includes production from five ore bodies by the NIRB in 2015 (Project Certificate #006). The mine plan includes open pits, underground mining and associated ore processing, waste management and ancillary infrastructure. Construction of the AWAR, camp, ore processing facilities and ancillary infrastructure began in 2017 and production from the Tiriganiaq deposit began in Q2 2019. The remainder of the orebodies are planned throughout the life of the Meliadine complex. In 2019, the Meliadine Mine NIRB Project Certificate (#006) was amended to include discharge of saline effluent to the marine environment via diffuser at Itivia Harbour and to convey via truck saline effluent along the AWAR to Itivia Harbour (i.e., Melvin Bay).

Studies of caribou behaviour were conducted in June and July 2020 and 2021 at the Meliadine Mine and AWAR in support of existing NIRB conditions as outlined in Project Certificate #006.

1.1 Terrestrial Environment Management and Monitoring Plan

The Meliadine Mine 2015 Project Certificate and 2019 Project Certificate Amendment from the Nunavut Impact Review Board (NIRB), Term and Condition 57 requires the Project to report in its annual NIRB report:

> *(T&C 57, b.) A detailed analysis of wildlife responses to operations with emphasis on wildlife behaviour, mortalities and displacements (if any), and responses to operations of the all-weather access road and associated access roads/trails;*

The Meliadine Mine Terrestrial Environment Management and Monitoring Plan (TEMMP; Agnico Eagle 2020) is designed to meet this condition, with a behaviour monitoring program (Section 4.5) that has two objectives:

- "To determine if caribou activity budgets change with distance from the mine, and to document caribou response to stressors.
- To determine if caribou distribution changes with proximity to the mine (i.e. do caribou avoid the mine)."

The behaviour monitoring program described in this report is designed to address the first of these objectives.

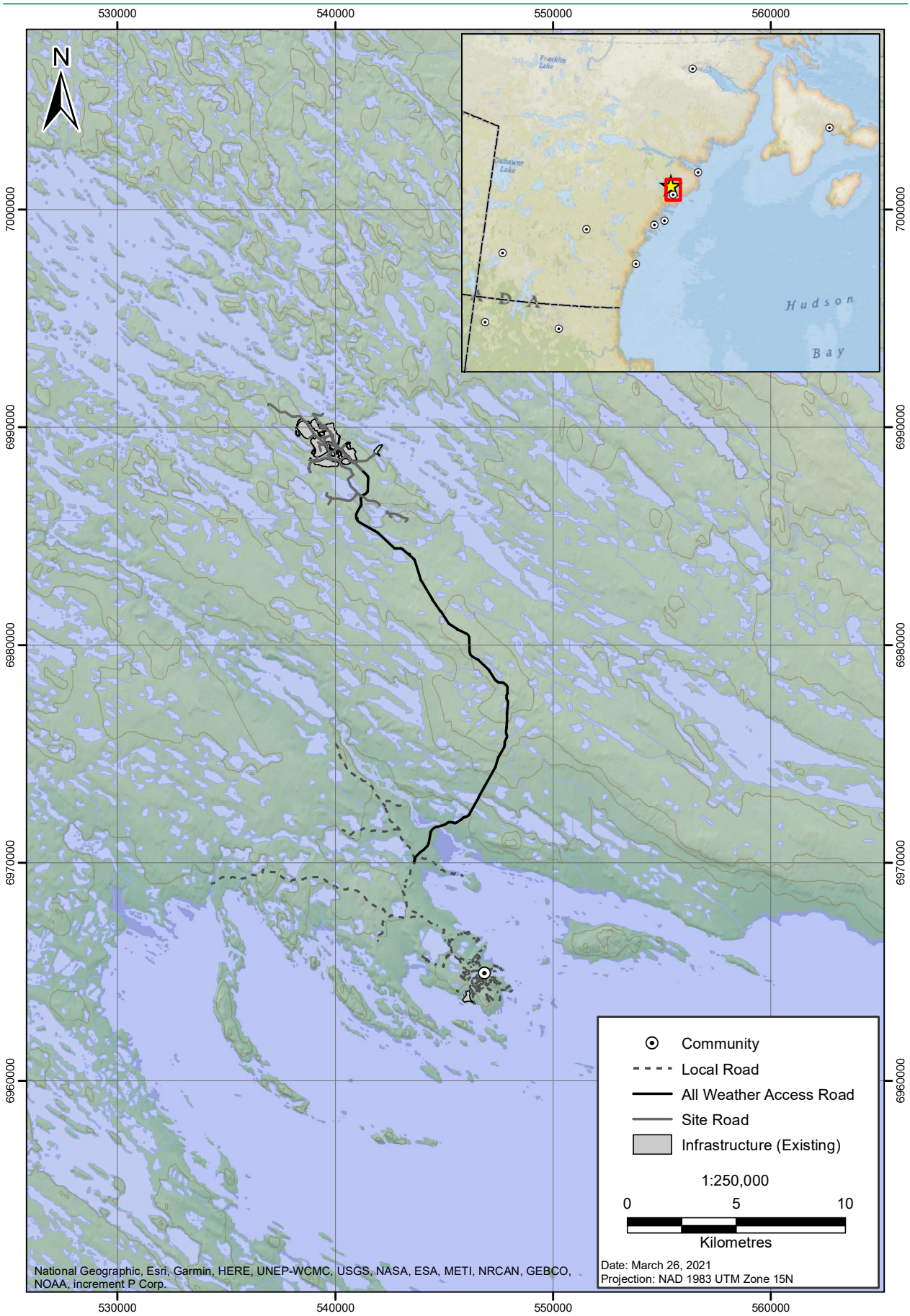


Figure 1-1: Meliadine Gold Project Location

2. STUDY OBJECTIVES

As stated, the overall objective of the caribou behaviour monitoring program as stated in the TEMMP is:

- To determine if caribou activity budgets change with distance from the mine, and to document caribou response to stressors.

The detailed objectives of the 2020 and 2021 study were:

1. To conduct a study using the Government of Northwest Territories Department of Environment and Natural Resources (GNWT ENR 2017) behaviour survey methodology at the Project site to estimate how the AWAR and site infrastructure contribute to cumulative effects of the project on caribou.
2. To collect a set of 100 samples of caribou behaviour across two years (2020 and 2021).
3. To use information from the surveys to determine what factors predict caribou behaviour, specifically comparing:
    - Near vs. far;
    - Large groups of caribou vs. small groups; and
    - Surveys with and without disturbances.

3. BACKGROUND

3.1 Qamanirjuaq Herd

The Qamanirjuaq caribou herd is a large caribou herd numbering approximately over 200,000 animals in 2017, down from over 300,000 animals reported in 2008 (COSEWIC 2016). The herd range is centered in south-eastern Nunavut. The herd range stretches approximately 1,000 km from Chesterfield Inlet in the north to northern Manitoba in the south, and from Hudson Bay on the east to eastern Northwest Territories and north-eastern Saskatchewan in the west (BQCMB 2020a).

The Beverly and Qamanirjuaq Caribou Management Board (BQCMB) has rated the Qamanirjuaq herd as having Medium vulnerability in 2014 due to continued population declines since 2008 (BQCMB 2014) and upgraded this rating to Medium-High in 2016 (BQCMB 2016).

The herd generally winters below the treeline in northern Manitoba, Saskatchewan and the adjoining areas of NWT and Nunavut. Spring migration is north along the coast of Hudson Bay, past the communities of Arviat, Whale Cove and Rankin Inlet to a broad calving ground generally centered on Qamanirjuaq Lake (BQCMB 2020a).

Following calving, the caribou form into large groups of hundreds to thousands of caribou and radiate out from the calving grounds, including east towards the coast. During July, groups of animals from this herd interact with the hamlet of Rankin Inlet, the Meliadine Mine and the AWAR connecting the two.

During summer and fall, the caribou generally move south and inland, gradually returning south towards their wintering areas by early December. Maps of the caribou range and movement are available on the BQCMB website (https://arctic-caribou.com/resources/).

4. STUDY AREA

The dominant terrain in the Project area comprises glacial landforms such as drumlins (glacial till), eskers (gravel and sand), and lakes. A series of low relief ridges are composed of glacial deposits, oriented in a northwest-southeast direction, which control the regional surface drainage patterns. The property is about 60 meters above sea level in low-lying topography with numerous lakes (FEIS; Agnico Eagle 2015).

The study area for behaviour monitoring included the existing Project footprint or the Meliadine Mine site and the AWAR, plus a 1 km buffer surrounding these areas. Surveys were conducted on any caribou that could be visually surveyed from Project infrastructure up to a distance of 3 km with the aid of binoculars and a spotting scope.

5. METHODS

5.1 Field Surveys

Survey methods followed protocols for monitoring caribou behaviour developed by the GNWT ENR. During 2020, ERM refined these methods for Agnico Eagle's Nunavut mine operations. The updated methods focus on scan samples, in lieu of both scan and focal samples. Given time and personnel constraints, this was determined to be a more efficient use of time and produce better quality data that is suitable for statistical analysis. The updated methods also include an initial survey step to randomize which group of caribou to monitor when multiple groups are available. In 2021 these methods were further refined to reflect lessons learned in 2020. The 2021 updates included using a rangefinder to measure distance and recording additional information such as whether the caribou occurred on the east or west side of the road. Detailed protocols are attached in Appendix A.

Prior to the arrival of caribou in June, a wildlife biologist from ERM conducted a classroom and practical training program for Agnico Eagle environmental technicians from the Meliadine Mine. The ERM wildlife biologist with an assistant was tasked with conducting behaviour observations as a primary role during July, while Meliadine technicians conducted behaviour observations opportunistically during other fieldwork in alignment with the TEMMP.

The overall method for the field surveys was to identify caribou groups visible from the mine site and AWAR, to select some groups for observation, and to record the behaviour of individuals in groups of different sizes including their responses without any disturbance and in response to mine-related activities and natural factors. Surveys were conducted in late June and early July during the post-calving and early summer periods, when caribou pass through the Project area in large numbers.

The first step involved a reconnaissance survey to identify where caribou groups were located. Where multiple groups were observed, surveyors chose which group to sample using a random number table. Field methods included the recording of site information at the location of each survey, including GPS coordinates, weather conditions, road structure, and location of the caribou group in relation to the surveyors and the road. Individuals in the group being observed were categorized when the survey started and at three minute intervals for 30 minutes.

Behaviour categories and their definitions were standardized following GNWT ENR (2017) classifications. The behaviour categories were: feeding, lying down, standing, alert, walking, and trotting or running. Alert behaviour and trotting or running were considered disturbance "response" behaviours and were grouped together in the subsequent data analysis.

At each three-minute interval, surveyors recorded the numbers of individuals in the group exhibiting each behaviour at that time. If the group was too large to be counted in each interval (>100 individuals), an identifiable subset of the group was surveyed during each interval and the total group size was recorded on the datasheet. In the case that a disturbance event occurred during the survey, such as a vehicle driving on the road, the time and type of disturbance was recorded.

5.2 Data Analysis

The objective of the data analysis was to quantify trends in the survey data, and determine whether factors such as distance to infrastructure, group size, or the disturbances could be used to explain caribou behavior. An initial exploratory analysis was conducted to visualize the data and determine the appropriate method for analyzing the data. A regression analysis was conducted to test for statistically significant trends in the data.

To increase the statistical power to detect changes in caribou behaviour, the behaviour categories were grouped for analysis into “response” behaviours (alert and running) and non-response behaviours (feeding, lying down, standing, and walking). It is acknowledged that walking may be considered a response behaviour in some situations, but given the sample size after 2021 it was not possible to subdivide the data further without losing statistical stability.

Generalized linear models (GLMs) were used to assess the differences in the proportion of response behaviours in surveyed animals as a function of various controlling variables, including the occurrence of disturbances. This regression framework provides a means to control for habitat, environmental variables, repeated measurements, and spatial correlation.

Statistical analysis were conducted using variables averaged over the entire 30-minute survey period, rather than breaking the data down by three-minute intervals. Two dependent variables were tested:

1. The first dependent variable tested was the average proportion of response behaviours in each survey, and this variable was modelled using a binomial distribution.
2. A second dependent variable was developed to track the number of minutes it took caribou to return to background behavior levels every time there was a disturbance. This variable, called “duration of response”, was assessed for each survey and modelled with a normal distribution.

The two dependent variables were each modelled against a suite of potentially important variables to determine if there was any statistical relationship with response behaviour. The variables included in this preliminary analysis were group size, distance to road, temperature, wind speed, and a binary variable identifying whether or not a disturbance occurred in the survey.

For each dependent variable, GLMs were constructed and tested for model fit, as evidenced by the Akaike Information Criterion (AIC). AIC is a number that is helpful for comparing models as it includes measures of both how well the model fits the data and how complex the model is (simpler is usually better). The top models were identified as having a low AIC and were within a 2-unit difference in AIC ($\Delta AIC \leq 2$) of the top-ranked model (i.e. the model with the lowest AIC; Burnham & Anderson 2004). This is the industry standard for identifying models that are essentially ‘equally good’ at explaining the data. Models with a difference in AIC (ΔAIC) of 2 to 4 from the top model are generally considered to have ‘limited support’.

6. RESULTS AND DISCUSSION

6.1 Caribou Distribution Relative to the Project

During late June and early July in both 2020 and 2021, caribou GPS collar locations were provided to the Project though a data sharing agreement by the GN. These data indicated that caribou were approaching the Project site. Height of Land and road surveys were conducted three times per day by Agnico Eagle environment technicians in order to trigger management actions. These data informed the decision to begin behaviour surveys for caribou as they approached the site.

Survey locations by date are presented in Figure 6.1-1. From June 27 to July 12, 2021, groups of caribou from the Qamanirjuaq herd were observed passing through or near the study area, with numbers peaking from June 29 to July 2. This was approximately one week earlier than peak caribou detections in 2020, which occurred from July 4 to 9, 2020. In both years the majority of surveys were conducted on the northern portion of the AWAR.

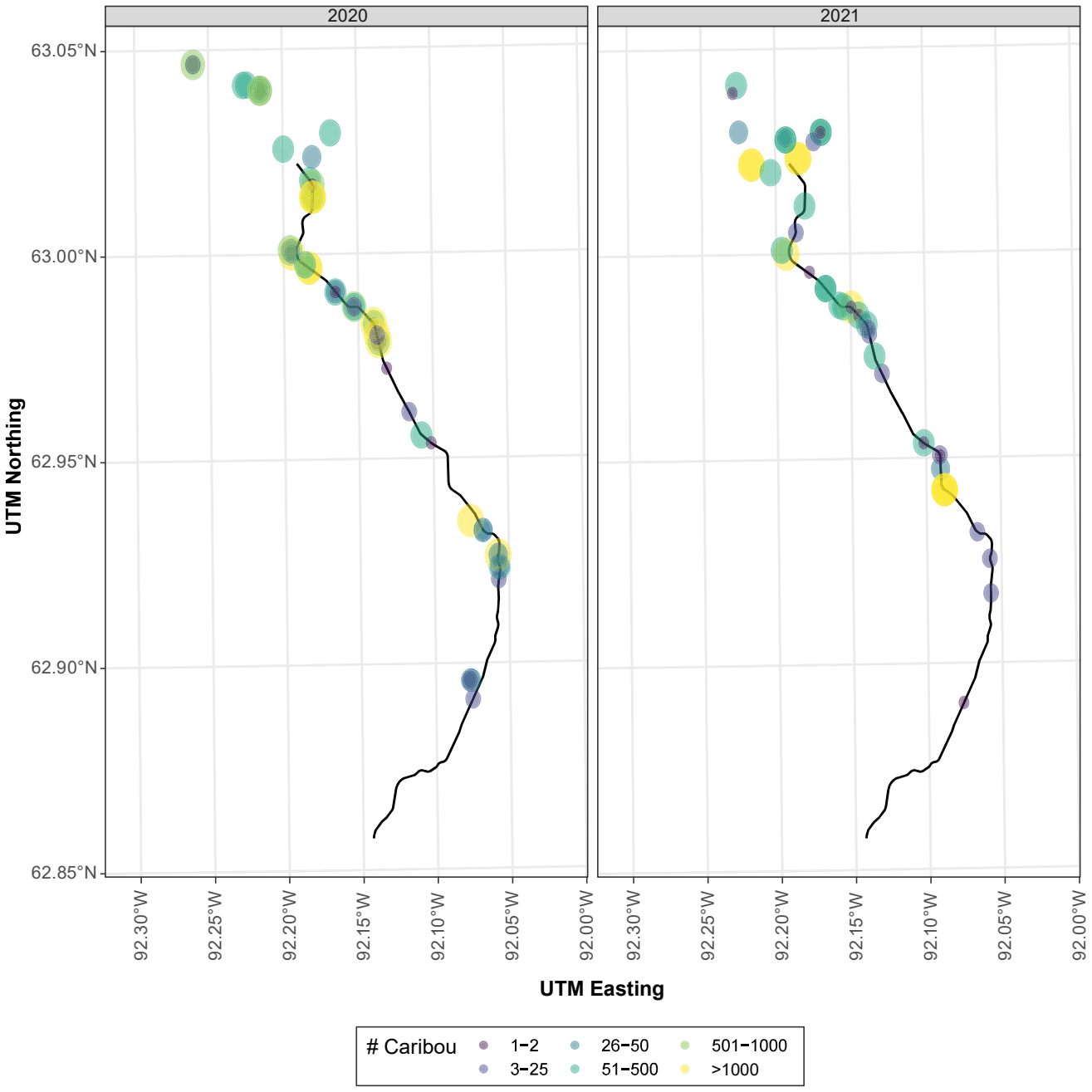
As the post-calving period progressed, caribou were observed more frequently in the southern portion of the road near Rankin Inlet. Fewer behaviour observations were conducted on the southern portion of the AWAR due to safety concerns near active harvesting activities and COVID-19 safety rules prohibiting contact between mine site personnel and community members.

6.2 Field Surveys Completed

In total, 46 behaviour surveys were conducted during the two-week period in 2021 (June 29 to July 12) when groups of caribou were near the Project. This is compared to the 56 surveys completed in 2020 (Table 6.2-1). Surveys were conducted opportunistically whenever caribou were encountered during daily reconnaissance drives, primarily along the AWAR but also around the mine site when the opportunity arose.

Table 6.2-1: Meliadine Caribou Behaviour Surveys Data Summary

Caribou Group Size	2020			2021		
	Total Number of Surveys	Surveys with Disturbances	Surveys with Observed Road Crossings	Total Number of Surveys	Surveys with Disturbances	Surveys with Observed Road Crossings
1-2	5	4	2	8	5	0
3-25	11	2	2	11	7	3
26-50	9	3	0	2	0	0
51-500	14	11	1	16	8	6
501-1,000	6	3	1	0	0	0
>1,000	11	6	0	9	7	3
Total	**56**	**29**	**6**	**46**	**27**	**12**



Note: Colour and size indicate group size, and the location of the All-Weather Access Road is indicated by the black line.

Figure 6.1-1: Locations of Behaviour Surveys by Date

In general, in July during the post-calving and early summer periods, barren-ground caribou aggregate into large groups (COSEWIC 2016; Russell and Gunn 2019). There were several days where only a single group of more than 1,000 individuals and up to 50,000 individuals was encountered. In order to diminish the risk of pseudo-replication, surveyors waited at least one hour before surveying the same group. This should be considered when assessing the robustness of subsequent statistical analyses. A logistical constraint on sample size will likely also have to be a consideration for future behaviour surveys at Meliadine, which will always occur during the high density post-calving season.

Overall, the survey methodology worked well for the Project location and circumstances, and the survey results were generally consistent between 2020 and 2021. All reported results use the combined data from 2020 and 2021, unless otherwise stated. General observations on survey methodology and results included:

- In 2020, fifty-six surveys were conducted by an ERM biologist and Meliadine environmental technicians, compared to forty-six in 2021. Given the logistical challenges of: 1) the caribou being on-site for a short period; 2) the southern part of the road being unusable during harvesting activities; and 3) the vehicles being stopped by caribou on the road, the goal of 50 surveys per year represents the upper limit of what can reasonably be achieved.
- Surveys were well distributed across a range of group sizes (Table 6.2-1). Surveyors reported that the addition of a reconnaissance survey and random selection of which group to survey assisted with a relatively even distribution of survey intensity across group sizes. An exception in 2021 was that there were no surveys of groups of 501-1000 individuals because none were encountered.
- Of the 102 surveys completed across both years, more than half recorded at least one disturbance during the survey (Table 6.2-1). During much of the period when caribou were present in the study area and surveys were being conducted, there were sufficient caribou near the road that the AWAR was closed to mine traffic. An exception was made for approved convoys of mine vehicles that occurred approximately three times per week for crew change and exchange of essential goods.
- In total, 43% of disturbances were from ATV traffic, 30% were from light trucks, and 12% were from convoys. Light trucks (pickups) included trucks from community groups conducting monitoring, the Hunters and Trappers Association and Kivalliq Inuit Association, the pickup used for caribou surveys, or other Project environment pickups.
- The AWAR was closed to mine traffic during many of the surveys, leaving a small number of essential vehicles on the road, generally pickup trucks. It is expected that the ratio of ATVs to total traffic would therefore be higher during road closures because total traffic is much reduced.
- It should be noted that surveyors specifically sought to survey caribou during convoys and would be stationed to monitor any nearby caribou during convoys. This was due to the relative shortage of data on mine-related traffic disturbances.
- The methodology allowed for the estimation of baseline behaviour, response to disturbance, and return to baseline behaviour. Few surveys ended before caribou returned to baseline behaviour. Thus, 30 minutes appears to be an appropriate survey length. Caribou surveys were considered an essential activity by the Project, allowing the survey pickup truck to be used on the AWAR even when the road was closed to normal mine traffic. However, all vehicles must stop when caribou are on the road, leading to long periods where the survey truck was stopped on the road.
- Most caribou behaviours were calm, generally foraging, and not moving quickly (non-response). The one exception was smaller groups who moved more than larger groups – more walking and trotting. As a consequence, caribou were observed crossing the road in only 10% of surveys in 2020 and in 25% of surveys in 2021, primarily in small groups of less than 25 individuals.

- One source of uncertainty in 2020 was consistently estimating distance. Hence, distance was categorized into blocks of 0 to 50 m, 50 to 100 m, etc. A rangefinder was used in 2021, which allowed for increased accuracy and for distance to be considered as a continuous variable rather than a categorical value. However, in this analysis the categories of distance were maintained in order to be able to group the two years of data together.

6.3 Survey Results

6.3.1 Exploratory Analysis

The exploratory analysis was conducted to determine if there were any trends or interactions in the following variables: road crossing, group size, distance to the infrastructure (AWAR/mine), weather and timing, side of the road (east or west), number of disturbances, and response time following disturbances. All results use the combined data from 2020 and 2021, unless otherwise stated.

Road Crossing

Results of the exploratory analysis indicated, unsurprisingly, that groups closer to the road at the start of the survey were more likely to cross the road during the survey (Figure 6.3-1). This trend was seen in both 2020 and 2021.

Group Size and Distance to Infrastructure

Plotting the caribou group size against the distance of caribou groups to the road at the start of the survey revealed that small groups (less than 50 individuals) were observed in equal proportions across all distances, regardless of year (Figure 6.3-1).

Large groups tended to be observed further from the road at the start of the survey. No groups larger than 50 individuals were recorded within 100 m of the road at the start of the survey, and no group larger than 500 individuals was recorded within 300 m of the road at the start of the survey. Regardless of the mechanism, these potential trends need to be considered so that statistical analyses are not confounded.

Behaviour Type, Group Size and Distance to Infrastructure

Average proportions of each behaviour type by group size and by distance to road are presented in Figure 6.3-2. When analyzed by group size, the results suggest that the average proportion of the response behaviours of “Alert” and “Trotting” are largest in small groups, with the highest proportion consistently observed in groups smaller than 25.

When analyzed by distance to road, the results suggest that the proportion of response behaviours is higher closer to the road than further away, with the proportion dropping off in groups further than 300 m from the road. However, due to the previously mentioned correlation between group size and distance to road, these data cannot discern between two possibilities – that caribou are more likely to be disturbed near the road, or that small groups of caribou are more likely to have a higher baseline level of response behaviours. In future years of surveys, additional data with large groups observed close to the road will be required to resolve between these two possibilities.

The result that smaller groups displayed alert behaviours more frequently than large groups is interesting. The activity level of smaller groups was higher, with 50% or more of time spent in alert behaviour and running in the absence of any disturbance. This was especially true near the road (i.e., within 50 m when the survey started). This was a clear trend in both the 2020 and 2021 data.

It should be noted that the variable used here to approximate distance to road is actually distance to observer, which is usually but not always the same as distance to road. In 2021 distance to road and

distance to observer were collected separately, but for the purpose of continuity across the two years, distance to observer was used throughout this analysis. Additional years of data will allow for the more accurate distance to road variable to be used in place of distance to observer.

Behaviour Type and Environmental Variables

Figure 6.3-3 shows the relationship between 1) the proportion of response behaviours and 2) environmental variables temperature, wind speed, and date. This comparison was included to explore the possibility that environmental factors such as heat or high winds were influencing caribou behaviour during the survey. No trend is visible in the data and trend lines fit to the weather data are nearly flat with wide confidence intervals, suggesting that weather does not have a substantial effect on behaviour. Date was also not associated with caribou behaviour.

Upstream or Downstream Observations

The movement pattern for caribou in the Project area is variable. In some years, caribou primarily cross the road travelling east to west, and in other years it is the opposite. In both 2020 and 2021, most of the observed caribou were travelling northwest to southeast from their calving grounds, around the west side of Meliadine Lake, and on to the coast to feed. Because of this, caribou were most often seen crossing the road from the west side (or the “upstream” side) to the east side (or the “downstream” side). It was hypothesised that behaviour may vary depending on whether the caribou had crossed the road already (East) or whether they were anticipating doing so (West). This statistic was recorded in 2021 only.

One hypothesis is that caribou are hesitating to cross the road but that once they cross the road, they move away quickly. If this were the case, the prediction would be that groups of caribou would be observed close to the road on the upstream side with fewer groups or groups further away on the downstream side. This predicted distribution was not observed. Instead, groups of caribou were observed near the road on both sides of the road. Figure 6.3-4 compares the distance to the road at the start of the survey with the location relative to the road (East or West). More surveys occurred further from the road on the east side of the road, downstream of the direction of travel. Nearly all surveys on the west (upstream) side of the road occurred within a kilometer of the road (panel b), but there were surveys close to the road on both sides of the road.

When proportion of each behaviour type was compared between surveys on the East and West (Figure 6.3-4; panel a), the two subsets were almost identical and no difference could be observed.

Number of Disturbances

Figure 6.3-5 shows a density plot for the proportion of response behaviours in three subsets of surveys; those with no disturbances, those with one disturbance, and those with multiple disturbances. The results suggest a slightly higher proportion of alert or running caribou in surveys where one or more disturbances occurred. This is more apparent in surveys with multiple disturbances than in those with only one. It should be noted that this figure is an average proportion of response behaviours across the entire 30-minute survey, so in some instances the proportion of response behaviours may have been obscured by the large number of intervals with no response behaviour.

When duration of response (i.e., time taken for caribou to return to a baseline condition following a disturbance) is compared with the proportion of alert behaviours, it appears that surveys with a higher proportion of caribou responding to the disturbance tend to take longer to recover to a baseline condition (Figure 6.3-5). Interestingly, it appears that surveys with multiple disturbances don't consistently produce a larger response or a longer one. Although the long-lasting full-group responses are in surveys with multiple disturbances, there are surveys with multiple disturbances that don't have large reactions or longer-lasting response durations.

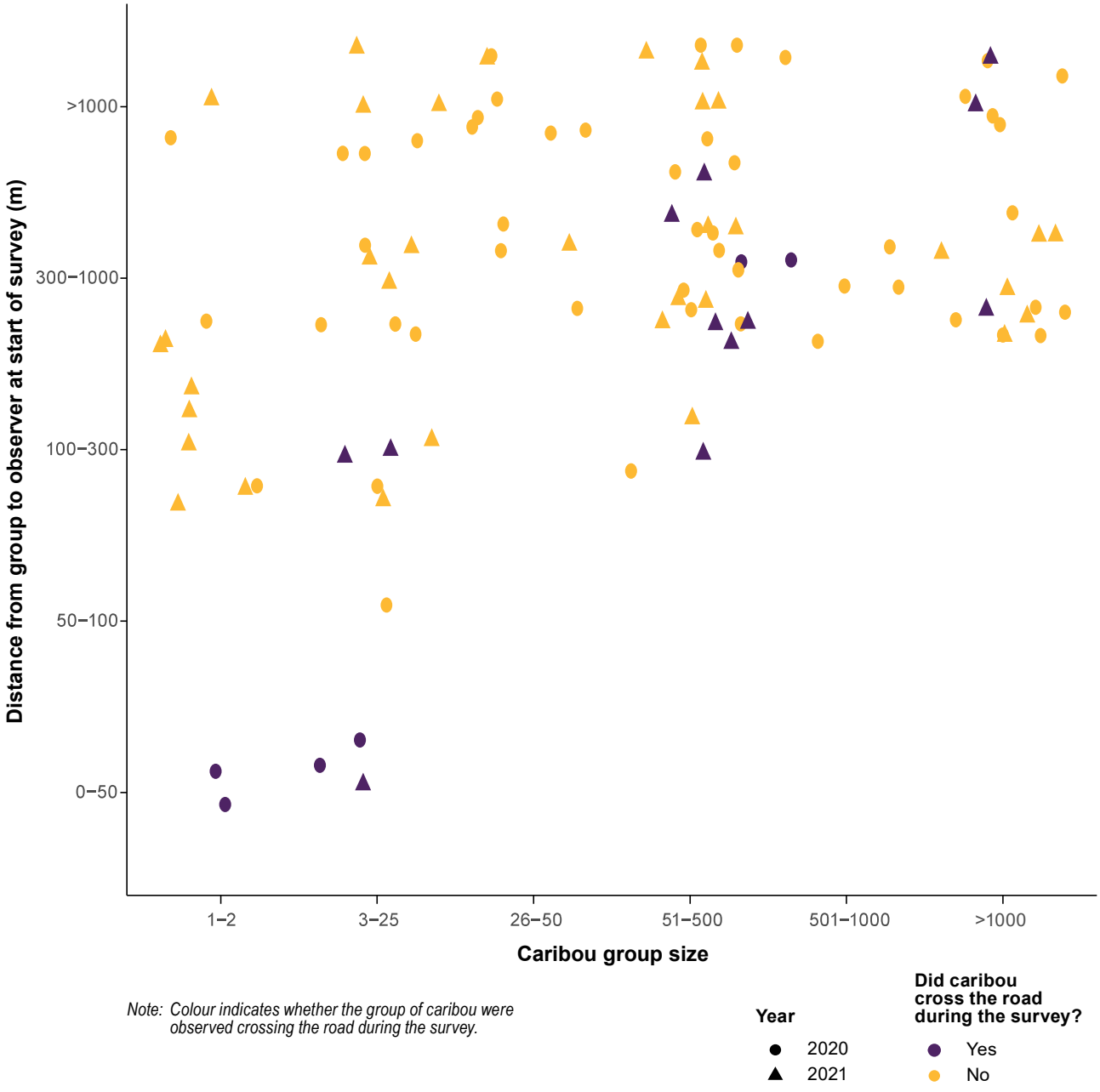


Figure 6.3-1: Caribou Group Size Versus Distance From the Surveyors to the Caribou at the Start of the Survey

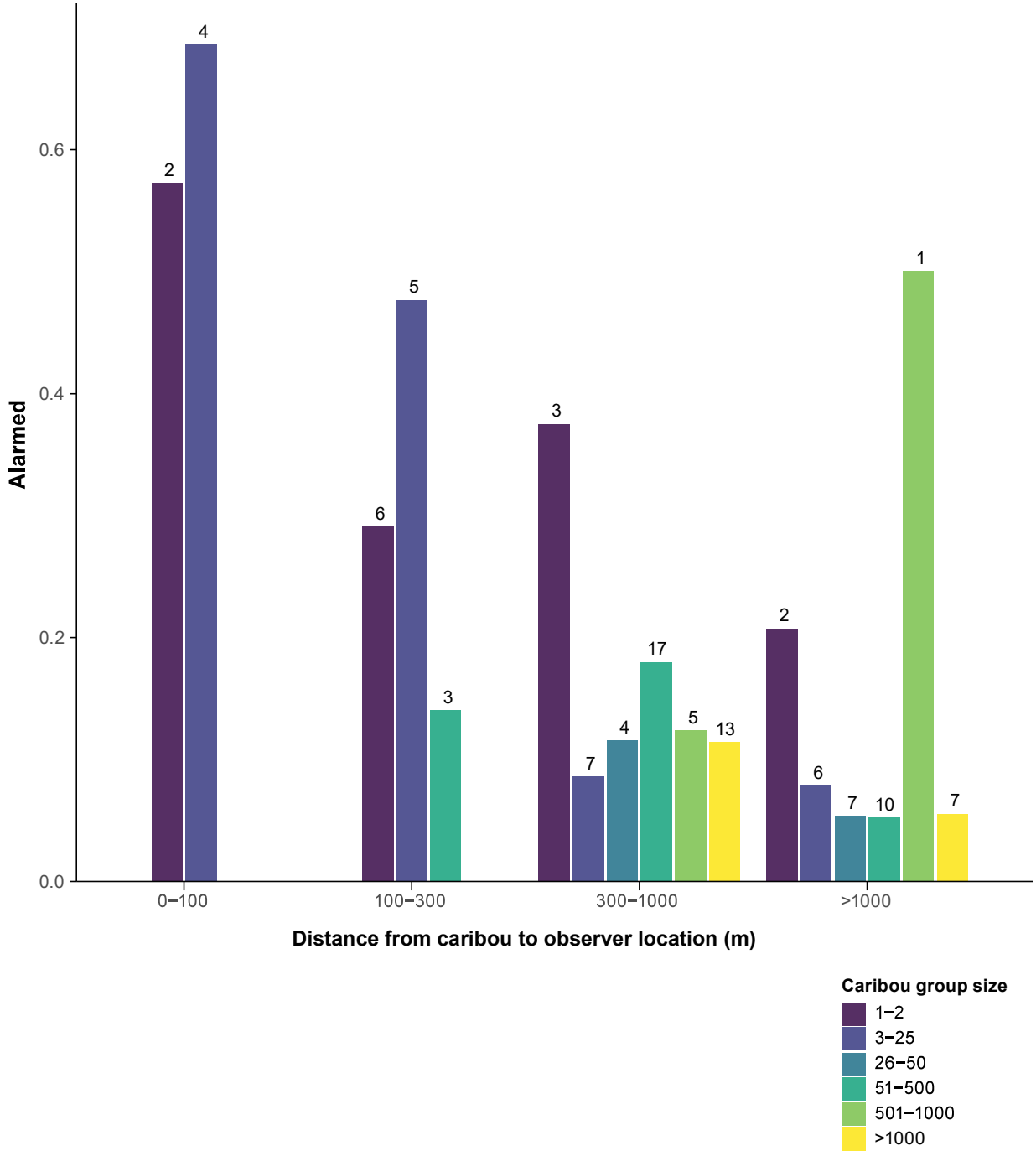
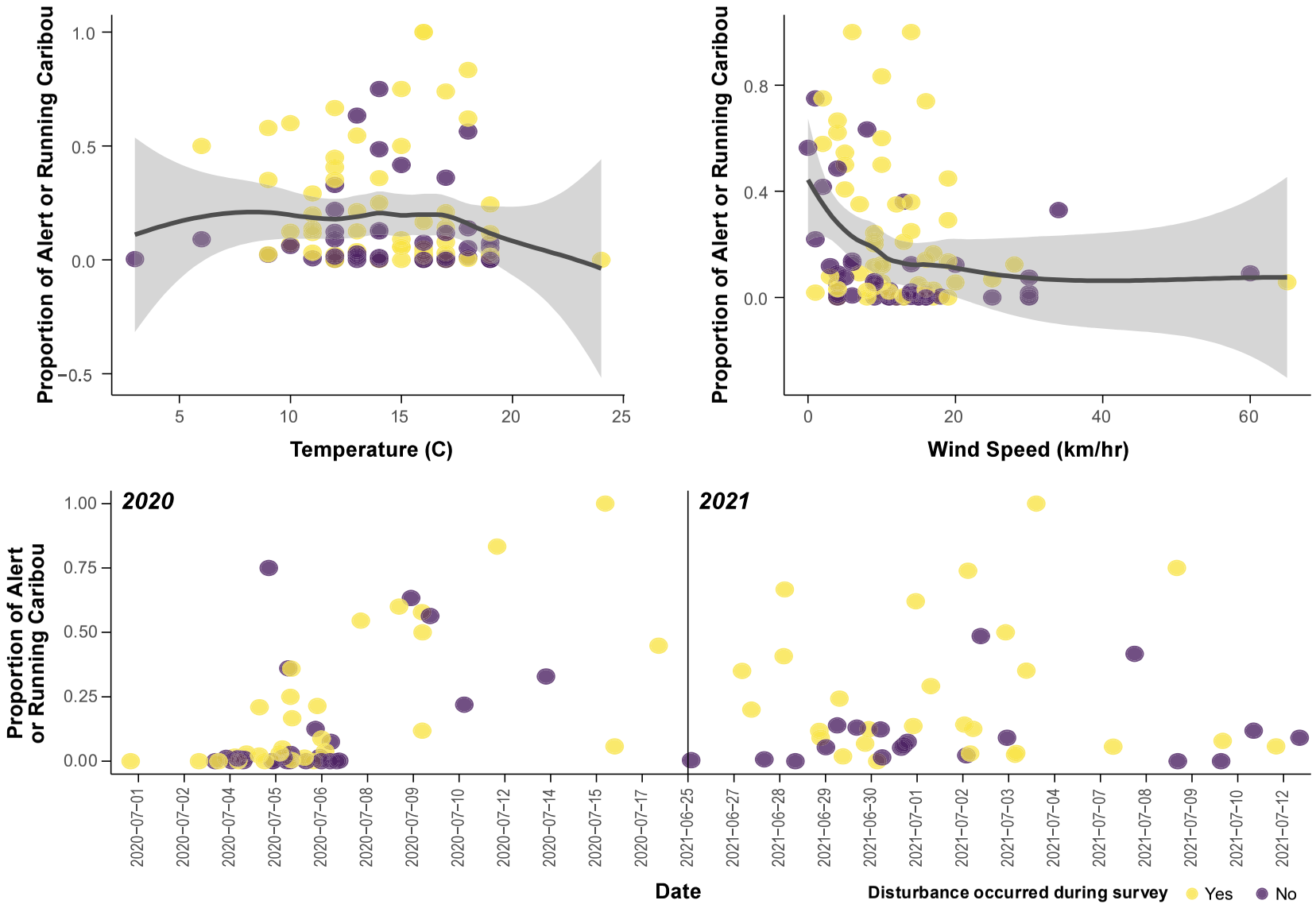


Figure 6.3-2: Average Proportion of Each Behaviour Type Observed Among; A) Different Caribou Group Sizes, and; B) Different Distances From the Surveyors to the Caribou at the Start of the Survey



Notes: Colour indicates whether or not a disturbance occurred suring the survey.
In the top two panels, an exploratory loess smooth fit is shown in grey with 95% confidence intervals.

Figure 6.3-3: Proportion of Alert or Running Caribou by Temperature, Wind Speed, Date, and Whether or Not a Disturbance Occurred During the Survey

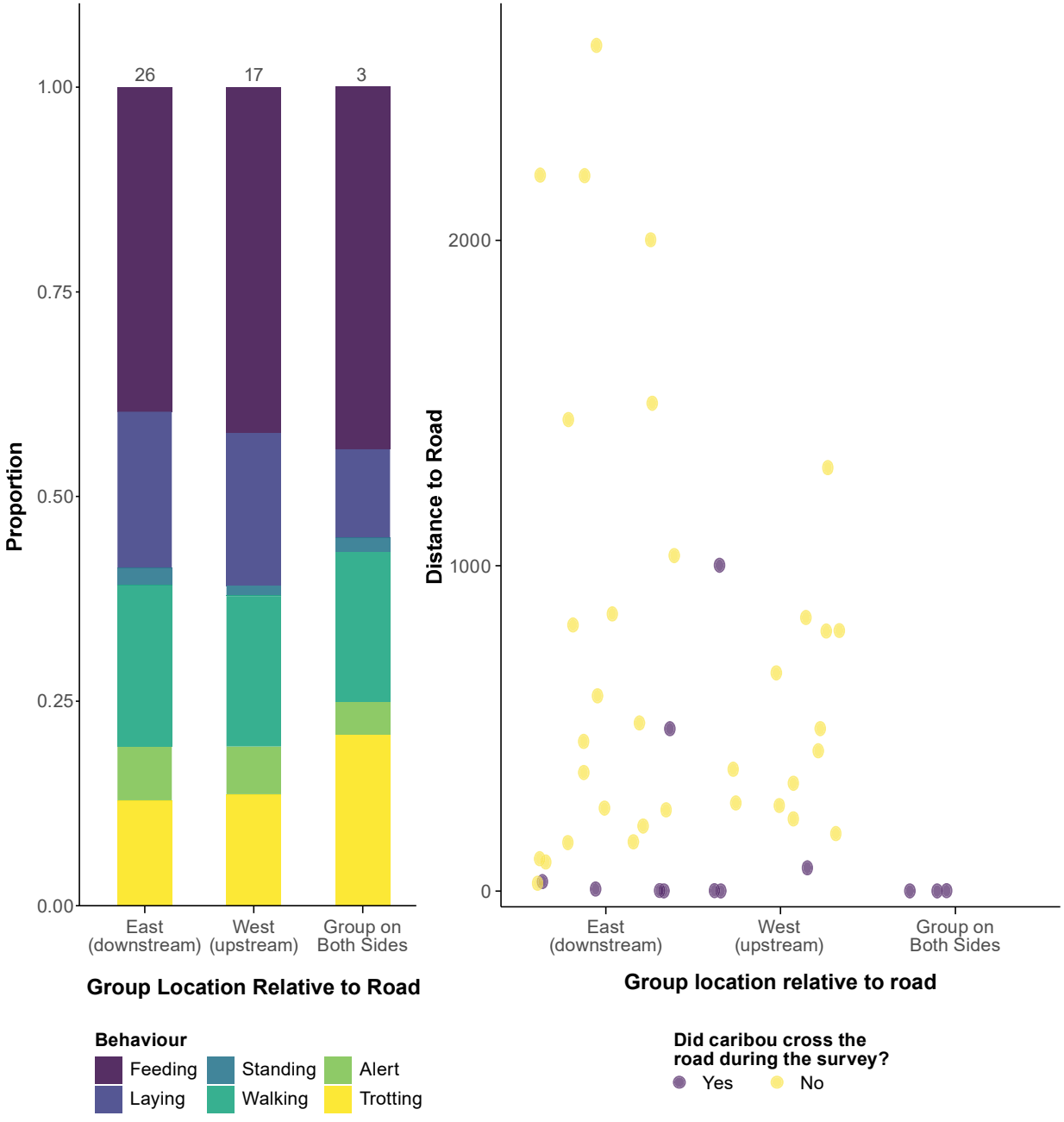


Figure 6.3-4: Comparison of Caribou on Upstream (West) and Downstream (East) Side of the Road

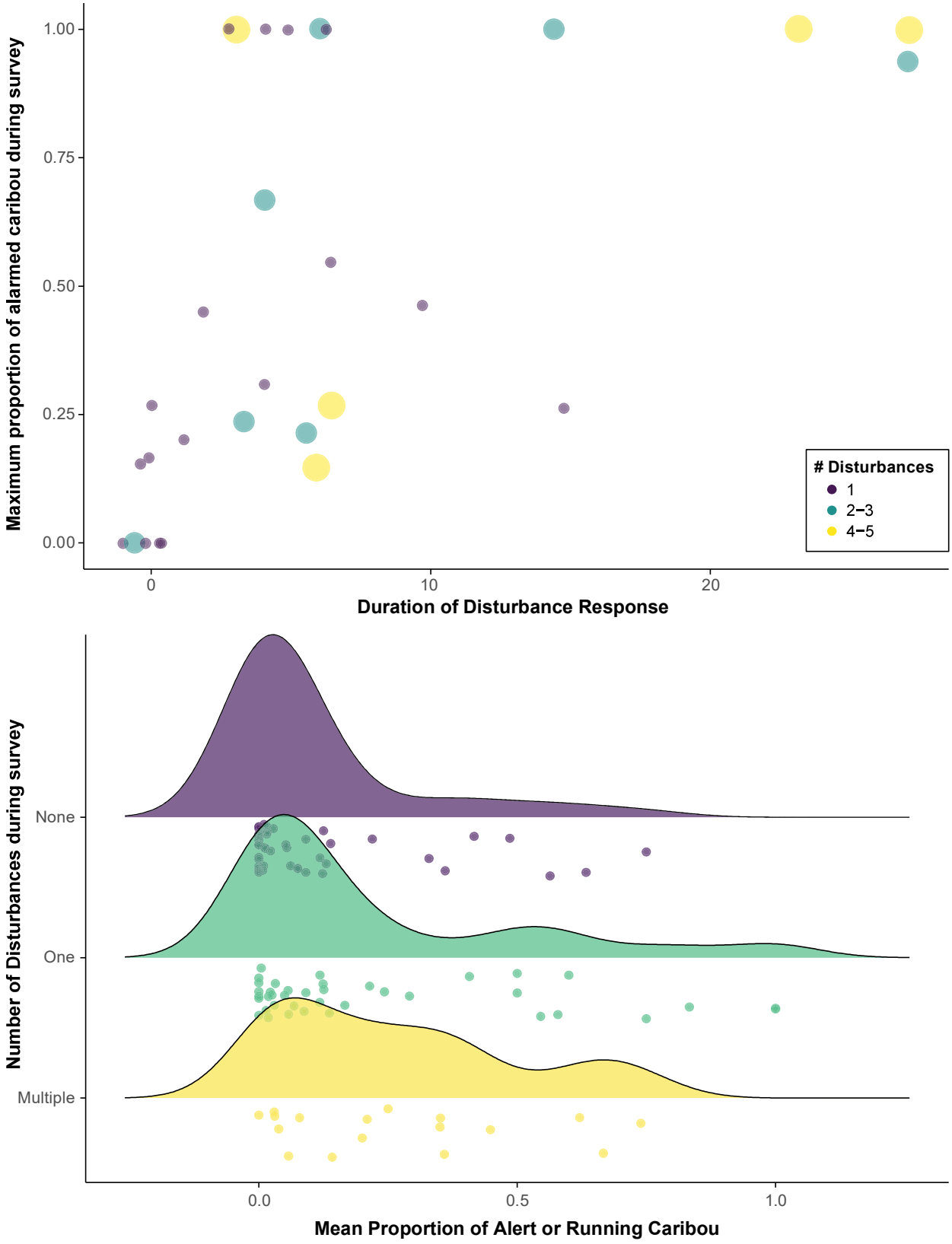


Figure 6.3-5: Comparison of Response Behaviours by Number of Disturbances

Response to Disturbances

Summarizing data over the entire 30-minute survey is useful for broad comparisons, but has the disadvantage that response behaviour can be washed out in a relatively uneventful survey. To examine the response to disturbances within a survey, the proportion of response behaviours was plotted by three-minute interval for each survey, as shown in Figure 6.3-6. In Figure 6.3-6, the response behaviours of "alert" and "trotting or running" are combined to create the total proportion of responding caribou in any given time interval, and plotted over time within the 30 minute survey. Disturbances are denoted with a vertical bar. A spike in response behaviours in the interval during a disturbance or immediately following a disturbance, suggests that the caribou are responding to the disturbance.

The results show that even in the absence of disturbances, an average of 5-10% of caribou typically exhibit response behaviours at any given time. This may be considered a "baseline" from which response to disturbances can be estimated. Figure 6.3-6 suggests that following a disturbance event, there was commonly a spike in the proportion of caribou with response behaviours increasing from 5-10% up to 60-90% of the group. The proportion of caribou with response behaviours returned to a pre-disturbance levels quickly, often within two intervals (6 minutes). For example, when a truck passed, most caribou would look up (which is classified as a response behaviour) and then return to feeding or standing (a pre-disturbance behaviour).

There was some variability in the proportion of response behaviours. During some surveys, there was a spike in response behaviours when no vehicle or other obvious disturbance was observed. In some surveys a vehicle passed by (a disturbance), but there was no increase in response behaviours observed in the caribou group on the subsequent time period.

6.3.2 Statistical Analysis

As group size and distance to road were identified as being potentially correlated during the exploratory analysis, a Chi-square test was conducted between the two variables to determine if they were too closely related to be included in a model together. A Chi-square ($\chi 2$) statistic is a test that measures how a model compares to actual observed data, and can be used to test for the correlation between two categorical variables. The resulting Chi-square statistic was significant ($p=0.003$), indicating that group size is associated with distance to road. In light of this, and in order to prevent overfitting the models, two separate models were run that included group size as an independent variable and distance to road as an independent variable, respectively. To bolster the sample size for statistical analyses, all analyses in this section were conducted on the pooled dataset of 2020 and 2021 data.

The results indicated that distance to road out-performed group size in all variable combinations, based on the equivalent model cut-off of $\Delta AIC<2$ suggested by Burnham and Anderson (2004). As a result, distance to road was used instead of group size in final models. The estimates and significance levels for the best-fitting model that used proportion of response behaviours as a dependent variable are presented in Table 6.3-1, and for the best-fitting model that used duration of response as a dependent variable in Table 6.3-2.

The statistics presented include the variable estimate, which can be interpreted as the expected effect on the dependent variable as the independent variable increases. For example, in Table 6.3-1 the negative estimate for temperature indicates that as the wind speed increases, the proportion of caribou with response behaviours decreases. However, estimates should always be considered in tandem with the standard error; if the standard error is larger than the estimate, the estimate is meaningless. The p-value statistic indicates whether the model is a "statistically significant" predictor of the dependent variable, regardless of how large the estimate is. A p-value of less than 0.05 suggests that the variable is an important determinant of the response, as it indicates there was less than 5% probability that the results occurred by chance.

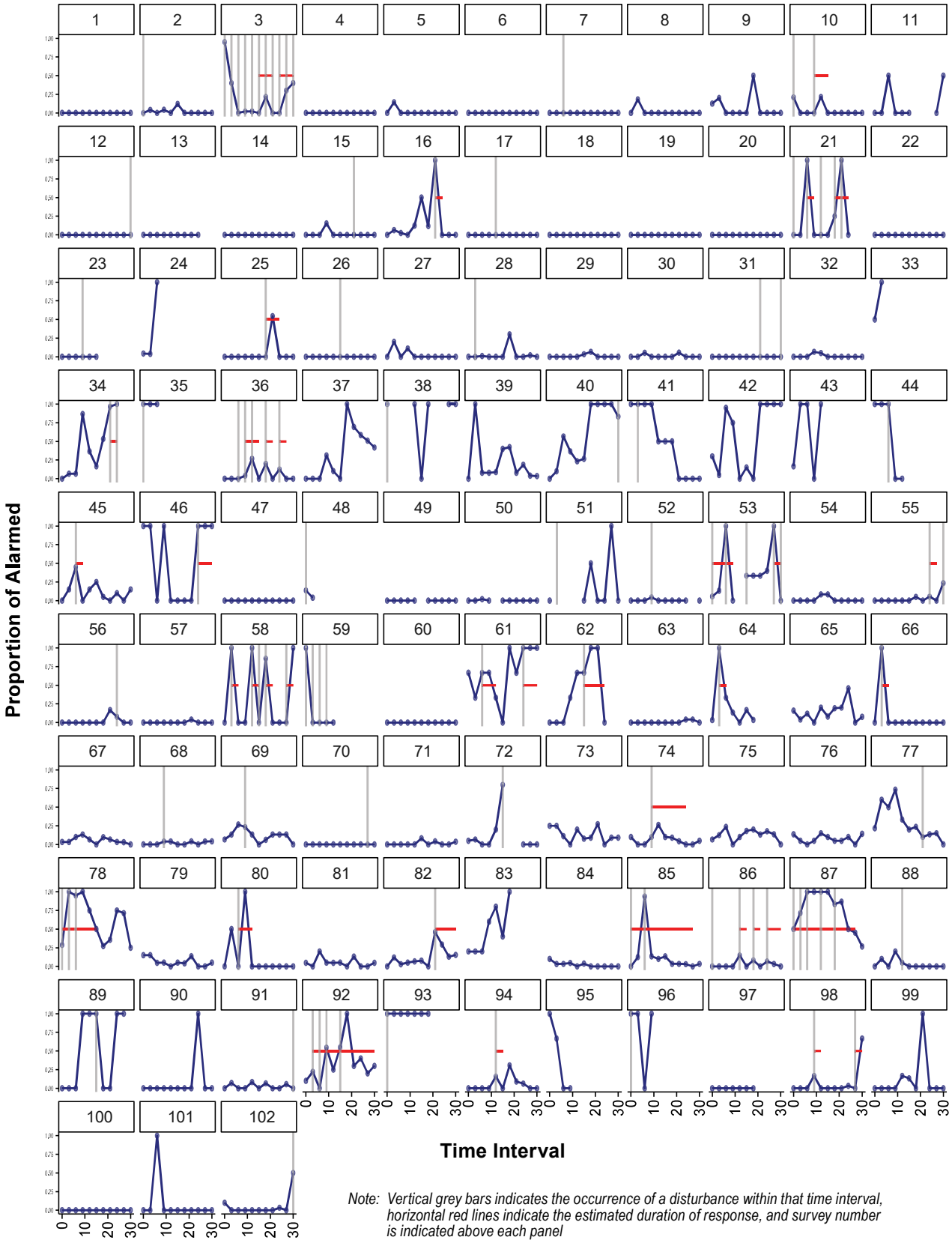


Figure 6.3-6: Proportion of Response Behaviour during Each Survey

Table 6.3-1: Summary of Model Coefficients and Significance Levels for Model Using Average Proportion of Response Behaviours as the Dependent Variable

Variable	Estimate	Standard Error	P-value
(Intercept)	0.19	1.06	0.861
Distance to road 50-100 m	16.20	2399.54	0.995
Distance to road 100-300 m	-0.95	1.11	0.395
Distance to road 300-1000 m	-1.84	1.04	0.080
Distance to road >1000 m	-2.63	1.15	0.022*
Wind speed (km/hr)	-0.05	0.04	0.226
Disturbance during survey (Yes)	0.93	0.62	0.130

Note:

** Statistically significant p-values <0.05 are indicated with an asterisk.*

Table 6.3-2: Summary of Model Coefficients and Significance Levels for Model Using Duration of Response as the Dependent Variable

Variable	Estimate	Standard Error	P-value
(Intercept)	6.00	7.39	0.423
Distance to road 100-300 m	-0.60	8.10	0.941
Distance to road 300-1000 m	1.42	7.59	0.853
Distance to road >1000 m	-2.73	7.72	0.726

Notes:

** Statistically significant p-values <0.05 are indicated with an asterisk.*

The bin of distance to road 50-100m is not included as there was no data on duration disturbed for caribou occurring at that distance.

The results of this analysis suggest that there is a weak differential effect of distance to the road on response behaviour, and that caribou were less likely to be exhibiting response behaviours further from the road. This effect was most apparent in the surveys on caribou greater than 1,000 m from the road, as the effect was significant in models that used proportion of response behaviour as the dependent variable (p=0.02), with an estimate of -2.63±1.15. This effect was not significant in models that used duration of response as the dependent variable, and in fact the standard errors in the best-fitting model were larger than the estimates. This indicates that a link between distance to road and duration of response could not be detected, possibly due to the small sample size.

There is some evidence that caribou were less likely to exhibit response behaviour in distances of 300 to 1,000 m from the road, with an estimate of -1.84±1.04 in proportion of response behaviour models (p=0.080). Temperature and wind speed were not found to have an effect on response behaviours in either model set.

When a subset of only 2021 data was used, which contains the more accurate distance to road variable, similar trends were detected. Once again, the distance to road variable provides a better model fit than caribou group size. Caribou further from the road were less likely to exhibit response behaviours (-0.0008±0.0007), but the effect was not significant (p=0.261). No model that incorporated side of the road (east or west) at the start of survey showed an effect.

These results should be treated with caution due to the relatively small sample size and because response behaviours were averaged over each 30-minute survey period. Nevertheless, these results are consistent with other surveys recorded on barren-ground caribou during the post-calving and early summer periods, which suggest that caribou behavioural responses to all-season haul roads tend to taper off beyond a zone of influence of approximately 500 m (Murphy and Curlato 1987; Johnson and Lawhead 1989; Dyer et al. 2001). However, zone of influence estimates are highly variable in the literature and further analysis will be required to adequately address this question for Meliadine. Responses to roads and infrastructure have previously been linked to increased harvest from roadways (Plante et al. 2018; Russell and Gunn 2019), a factor which was not included in this analysis.

One consideration with analyzing these data, is that the response of caribou to disturbances is relatively brief, lasting on-average 2 sampling periods (5.83 minutes). Using average behaviour type across the 30-minute (10 sampling periods) effectively dilutes the caribou response, and likely explains why duration of response models performed so poorly. With the addition of future sampling, it may be possible to examine average behaviours within a 30-minute sampling period; before a disturbance, immediately following the disturbance, and following return to pre-disturbance behaviour.

7. SUMMARY

The behaviour monitoring data from 2021 were combined with data from 2020, and all results outlined in this report use both years, unless otherwise stated. The program and combined data resulted in several key findings:

- The standard monitoring protocols adapted from the GNWT ENR worked well at the Project site.
- Forty-six surveys were conducted with the majority of observations between June 29 and July 2, 2021. This was approximately one week earlier than peak caribou observations in 2020. The data from 2020 and 2021 were combined to reach the goal of 100 surveys across two years.
- Observations were well distributed across a range of caribou group sizes from 1 to 2 individuals to >1,000.
- Small groups of <50 caribou were observed both near (<300 m) and far (>300 m) from infrastructure while large groups (>50) occurred beyond 300 m from infrastructure. Small groups consistently had a higher proportion of response behaviours (running, alert) than larger groups. This was true in both 2020 and 2021.
- Groups of caribou were observed near the road in equal proportions on both the upstream and downstream sides of the road, but were more often observed further from the road on the downstream side of the road. Behaviour did not differ between caribou on the two sides.
- An analysis of the data across both years indicated that there is a trend for caribou at greater distance from infrastructure (>300 m) to have a lower proportion of response behaviours. This analysis accounted for the difference in group size with distance, but should be interpreted with caution with only one year of data.
- The proportion of caribou with response behaviours in a group was unrelated to environmental variables including temperature and wind speed.
- Approximately half of the surveys included a disturbance event, typically from essential Project vehicles, mostly pickups, and all-terrain vehicles (ATVs) used by community members on the AWAR for travel and harvesting. Only one disturbance was recorded from a predator; the rest were from vehicles. The AWAR was closed to most Project vehicles when caribou were near the road and all Project vehicles stop when caribou are on the road.
- It should be noted that surveyors specifically sought to survey caribou during convoys and would be stationed to monitor any nearby caribou during convoys. This was due to the relative shortage of data on mine-related traffic potential disturbances.
- Following a disturbance event, the proportion of response behaviours in a group of caribou rose, but typically returned to baseline behaviours within two sampling periods (six minutes).
- The updates applied to the survey protocol in 2021 used feedback from the first year of data and analysis, and were helpful in improving the overall quality and accuracy of the data.
- Even with some changes to the protocol between 2020 and 2021, the trends in the results were highly consistent between the two years of data. This increases the confidence that an underlying effect has been detected. Additional data collection would bolster the sample size and improve the likelihood of detecting statistically significant effects.

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APPENDIX A DETAILED METHODS FOR CARIBOU BEHAVIOUR SURVEYS

DRAFT

AGNICO EAGLE

Meadowbank Gold Mine

Caribou Behaviour Monitoring

September 15, 2021

Project No.: 0597635

The business of sustainability

ERM

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APPENDIX A MEADOWBANK GOLD MINE: CARIBOU BEHAVIOUR MONITORING DATA SHEET

1. INTRODUCTION

Agnico Eagle Mines Ltd. (Agnico Eagle) would like to determine whether caribou behaviour changes in response to mine activities. The purpose of caribou behaviour surveys is to provide information to characterize the effects of the physical road and mine-related activities on caribou behaviour, including the All Weather Access Road (AWAR) and Haul Road.

The planned monitoring program is designed to collect data on caribou behaviour using standardized, scientifically-defensible methods. The data will be used to monitor Project effects.

1.1 Objectives

Following discussions with the Kivalliq Inuit Association and Government of Nunavut during the spring of 2021, the objectives of the behaviour monitoring program for caribou have been updated to the following:

- Evaluate the baseline behaviour of caribou (behaviour in the absence of disturbance);
- Evaluate the response of caribou to disturbances;
- Compare the behaviour of caribou between the following categories, if there is sufficient data:
    1) in large vs. small groups,
    2) near vs. far from the road,
    3) when the road is open vs. closed,
    4) east vs. west of the road, (upstream and downstream), and
    5) spring migration vs. summer and fall periods.

2. STUDY AREA

The study area for behaviour monitoring is anywhere that caribou may interact with the mine, including the All Weather Access Road (AWAR), the Meadowbank Mine site, Whale Tail site and the Haul Road connecting Meadowbank to Whale Tail.

3. STANDARD OPERATING PROCEDURES

The purpose of caribou behaviour surveys is to provide information to characterize the effects of the physical road and mine-related activities on caribou behaviour, including the All Weather Access Road (AWAR) and Haul Road. The overall method for the surveys is to identify caribou groups visible from the road, to select some groups for observation, and to record the behaviour of individuals in groups of different sizes including their behaviour without any disturbance and responses to both mine-related activities and natural factors.

Notes to guide the work include:

- Systematic surveys will be conducted along all Project roads during spring, summer and fall periods.
- The survey team will consist of a driver/observer and a second observer when available.

Surveys should be performed:

- During spring, summer and fall when caribou may be in the Project area,
- Of caribou at various distances from the road and group sizes, and
- If surveying effects of a convoy, conduct two surveys, one at least an hour before convoy deployment so that a pre-disturbance measurement can be made, and a second survey during the convoy passing by caribou.

3.1 General Field Data

For each survey day, the appropriate general field data will be recorded onto field data sheets supplied in Appendix A and B. A new data sheet will be used for each survey, including additional sheets as necessary to record all observations. General information includes:

- Survey date and start and end times.
- Field personnel (full names on the data sheet header and initials thereafter).
- Weather conditions during and prior to sampling (e.g., snow in the last 24 hours, current wind conditions).
- Site description: provide location and description (GPS coordinates, road name and distance marker).
- Photographs or video (if possible):
    - Take a photo of the caribou every time an observation is recorded so that the observations can be verified by a biologist.
    - For any photographs taken, record the picture IDs in the comments field on the field data sheet.
    - Write descriptions of any photos taken for specific reasons.
- General observations/notes of the environment/sampling procedures.
- Any deviation from the SOPs outlined below.

Note: When in doubt take pictures and make field notes explaining the situation, your response or consequent changes in methods. It is better to have more data/notes than not enough when interpreting the results later on.

3.2 General Equipment List

- A GPS unit with waypoints of road km markings.
- Field data sheets (Appendix A and B), clipboard, pencils, or iPad with data form.
- A timer capable of alarm setting for repeat time intervals (i.e., can be set to go off every three minutes, like a smart phone).
- Binoculars or spotting scope.
- Compass (or use compass function on GPS unit).
- Portable weather station (temperature and wind speed).
- Camera.
- Rangefinder.

3.3 Field Methods

3.3.1 Group Selection

The survey day will begin with a reconnaissance survey to determine how many caribou groups are present near the road, how large they are, and where they are. This will be accomplished by driving from the mine site along the road and noting relevant information about the groups and their sizes along the way (using the standard, tablet-based road survey form). Observers will preferentially choose groups to survey to across group sizes and distances from the road. Ideally, caribou would be sampled in an even distribution across these variables and along the AWAR and Haul Road. However, the nature of caribou and field sampling mean that observers may need to survey what caribou are available, rather than what is “ideal”.

Allow approximately one hour to survey each group. If the length of the survey day permits all groups to be surveyed then they should all be surveyed. If there are more groups to survey than the time in the day, then do the following:

1. Look at how many of each group size (bullet list below) have been surveyed to date. If one of them is under-represented and there is a group of that size on the road, then go survey that group. If there is more than one group of that size, choose it randomly using the procedure in step 4.
    - 1 or 2 caribou
    - 3 to 25 caribou
    - 26 to 50 caribou
    - >50 caribou
2. During 2020, few groups of caribou within 300 m of the road were observed or sampled. Preferentially choose groups of caribou within 300 m of the road, with a soft target of approximately 1/3 of samples in this area.
3. If any Project-tolerant caribou are observed (e.g., caribou observed near the road or mine site for more than 72 hours in summer and 48 hours in other seasons; TEMP 2020), then select these animals for sampling. In Appendix A data sheet, record that the group is Project tolerant in the notes field.
4. If there are multiple groups available, choose groups to fill in an even distribution of group sizes and distances from roads.

Record all caribou groups observed during the reconnaissance survey in the standard, tablet-based survey form and submit that data along with the results of behaviour monitoring.

3.3.2 Selection of an Observation Site

Find a safe parking location and follow site safety protocols. The observation location may be the vehicle itself or a safe location off the road. If observers exit the vehicle, the observation location should be chosen where observer activity is not likely to influence caribou behaviour and where the observer can remain comfortable for a period of approximately 45 minutes without needing to move. Ideally, the vehicle should be stopped a minimum of ~250-300 m from the caribou – adapt this distance as needed. If the animals are staring at the truck or moving away, then the truck is too close.

3.3.3 Data Recording

Allow 15 minutes between arrival and the time at which behavioural observations begin. This is to allow animals to return to behaviour that may have been interrupted by the arrival of observers. In the time before recording behaviour, fill in the top portion of the form with location, weather, and group size information.

After 15 minutes, begin recording data in the form in Appendix A. The start time to record is the time that observations begin.

3.3.3.1 Location

Location: Collect a waypoint of the location from which the observations will be made. Note the waypoint number and the UTM coordinates on the data sheet.

Road Condition: If observing caribou on a road, record whether the AWAR or Haul Road are open or closed.

Distance: Estimate the distance to the group using a laser rangefinder and, using a compass or the GPS unit compass feature, record the bearing (0° to 360°) to the group being observed. If the group of caribou is large and spread over a considerable distance from the road, estimate the distance to nearby caribou and the caribou furthest away that will be sampled. If some caribou in the group are too far away to sample, then do not include them in the distance estimate.

Behaviour: At each time interval during the survey, observers should record the number of individuals in the group exhibiting behaviour in each category. For clarity, observers should record zero values for behaviours not observed.

East vs. West: Note if the group is on the east or west side of the road. At the end of the 30 minute observation period return to the top of the form and record (Y or N) if the group crossed the road during the survey period. If monitoring at the mine site or Whale Tail, leave this section blank.

Sex: Note the sex of the group. This can be difficult in large groups, so record in the following categories: mostly males, mostly females, mostly females with calves, juveniles, or mixed group.

3.3.3.2 Weather Conditions

Use the portable weather station to record:

- Air temperature;
- Wind speed;
- Wind direction;
- Precipitation; and
- Humidity (if the weather station has this function).

3.3.3.3 Road Structure

At the location of the caribou group, record the road characteristics:

- Height of the road above the tundra (m);
- Slope of the road side (with of the slope in m);
- Approximate height of snow bank (m); and
- Any structures, such as bridges, present.

3.3.3.4 Caribou Behaviour

Individuals in the group being observed will be categorized when the survey starts and at three minute intervals. Standardized behaviour categories will be used (Section 3.3.4). The standardization of behaviour is necessary for clarity and data analysis. If the observed behaviour does not fit within any of the categories then observers have the option of noting other behaviour in the comments field. However, this should be used only rarely as most behaviour should fit in the primary categories listed below. If noting a new/different behaviour, please take a photo or video of the caribou.

The data to record at each three-minute interval are the numbers of individuals in the group exhibiting each behaviour at that time. Do not attempt to characterize the behaviour that occurred during the interval. If the group is too large to be counted in each interval, choose an identifiable subset of the group, count the individuals exhibiting each behaviour at each time interval, and add a comment that a subset of the group was sampled.

Indicate the total group size at the top of the data form, not the size of the subset whose behaviour was recorded. Count the number of caribou up to 100 animals, and then record group size in categories above 100; 100-200 animals, etc. (see Appendix A).

Practically, the easiest way to do this is to have the observer scan across the group of caribou from Left to Right, calling out the behaviour of each animal, while the recorder adds tick marks to the data sheet. When complete, count up the tick marks.

3.3.3.5 Disturbance Events

Caribou behaviour is expected to vary in response to some disturbance events. The bottom of the data form should be used to record any potential disturbance events evident to the observer regardless of whether caribou respond to them. The main categories of events are included in the data sheet:

- Light truck;
- Haul truck;
- Road maintenance vehicle (e.g., grader);
- ATV or skidoo;
- Aircraft; and
- Predator (note species).

Record the number and approximate speed of the vehicle (regular driving speed, or moving slowly, ~10 km/h, past caribou).

Record the time of the disturbance event (0:00 to 30:00 of the survey), indicate which type of disturbance was observed in the appropriate column. Record any additional comments and records of photographs taken in the final column.

Record whether the vehicle stopped when approaching caribou or continued to drive slowly. If possible, coordinate with passing vehicles on the road to have some vehicles stop for 10 minutes, and others drive by slowly.

3.3.4 Behaviour Classification

With the exception of Alert behaviour, the primary behaviour categories and their definitions follow classifications from the Government of Northwest Territories (GNWT 2017). The categories appear as columns on the data form, with descriptions on the form. The behaviour categories are:

- **Feeding –** standing or walking posture, with the muzzle touching or nearly touching the ground; can be ingesting food or not; head down or moving from side to side.
- **Lying down –** bedded on the ground, either upright or lying on its side, in a resting or ruminating position.
- **Standing –** stationary in an upright, standing posture with head elevated above the ground, and usually above the knees; if cow is nursing, if possible record the time spend nursing.
- **Alert –** head up scanning horizon or focused on a source of disturbance (e.g., vehicle, predator, human).
- **Walking –** similar to standing posture but moving at a slow gait (<5 km/h).
- **Trotting/running –** similar to standing posture but moving rapidly in symmetrical or asymmetrical gait.

Other behaviours that may be observed (record in comments field on form) are:

- **Nursing –** calf is suckling cow.
- **Sparring –** two males in contact.
- **Insect response behavior –** twitching, stamping, tossing head.

In the comments, record if any animals are moving towards the road, parallel or away from the road.

4. DATA MANAGEMENT

Please scan all data sheets at the end of the day. Data from behaviour surveys should be entered into Excel. Data from group selection surveys (standard tablet data form) and behaviour surveys should be delivered at the end of each month to ERM for QA/QC.

5. CLOSURE

This SOP has been produced for Agnico Eagle Meadowbank Division by ERM Canada. Please contact the authors with any questions.

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APPENDIX A MEADOWBANK GOLD MINE: CARIBOU BEHAVIOUR MONITORING DATA SHEET

Meadowbank Gold Mine: Caribou Behaviour Monitoring Data Sheet

Date:	Time (24 hr [00:00 to 24:00]) Start:		End:
Observers:			
Location Waypoint number:	UTM Easting:	UTM Northing:	Road name and distance marker:
Distance from caribou to observer location (use rangefinder).		(if group diffuse, estimate average distance)	Bearing:
Is group location East or West of the Road at start of survey? Circle one: **E W**		Did the group cross the road during the survey? Circle one: **Y N**	
Caribou group size: Exact count (up to 100): _____ Estimated size for larger groups. Circle one: **101-200 201-500 501-1000 >1000**			
Record sex of group (mostly males, females, females with calves, mostly juveniles, or mixed group):			
Temperature: ___°C Wind speed: _____km/h Wind direction:_____° Humidity:_____% Days since last snow or wind event: _____			
Weather observations:			
Road: Open? Closed? Road Height:	Road Side Width:	Structures/snowbank Present:	

Observation time from start of survey	Number of animals exhibiting each behaviour type						Comments and photo numbers (Note if any caribou crossed road or travelled along road)
	Feeding	Lying Down	Standing	Walking	Alert	Trotting or running	
0 minutes							
3 minutes							
6 minutes							
9 minutes							
12 minutes							
15 minutes							
18 minutes							
21 minutes							
24 minutes							
27 minutes							
30 minutes							

Observed disturbance events

(record time from start of survey and check type of disturbance. Record whether vehicle stopped (s) or drove slowly (d) past caribou)

Time from start of survey	Light truck	Haul Truck	Road maintenance vehicle (e.g., grader)	ATV	Aircraft	Predator (note species)	Comments and photo numbers. Note other disturbances here

Categories and Definitions of Behaviour[1]:

- **Feeding –** standing or walking posture, with the muzzle touching or nearly touching the ground; can be ingesting food or not; head down or moving from side to side.
- **Lying down –** bedded on the ground, either upright or lying on its side, in a resting or ruminating position.
- **Standing –** stationary in an upright, standing posture with head elevated above the ground, and usually above the knees; if cow is nursing, if possible record the time spend nursing.
- **Alert –** head up scanning horizon or focused on a source of disturbance (e.g., vehicle, predator, human).
- **Walking –** similar to standing posture but moving at a slow gait (<5 km/h).
- **Trotting/running –** similar to standing posture but moving rapidly in symmetrical or asymmetrical gait.

Other behaviours that may be observed (record in comments field on form) are:

- **Nursing –** calf is suckling cow.
- **Sparring –** two males in contact.
- **Insect response behavior –** twitching, stamping, tossing head.

[1] Primary source: GNWT-ENR 2017 caribou behaviour monitoring field protocols, courtesy of GNWT Yellowknife, NT.

APPENDIX B DATA FROM CARIBOU BEHAVIOUR SURVEYS

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Observers	Waypoint	UTM E	UTM N	Road Name and Distance Marker	Distance from Caribou to Observer Location (m)	Distance from Caribou to Road (if different)	Bearing	Is Group East or West of Survey?	Did the Group Cross the Road during the Survey?	Caribou Group Size (Exact Count or Estimate)	Dominant Group Sex	Temp. (°C)
1	25-Jun-21	9:15	9:45	NM, NZ	C01	539148	6990423	Mine Site	600	600	270	E	N	250	females with calves	3
2	27-Jun-21	16:10	16:39	NM, NZ	C03	547416	6978330	AWAR km 16	261	261	90	W	N	8	females	9
3		11:24	11:54	NM	C02	539021	6990208	Mine Site	2100	1500	360	E	N	1	females	11
4	28-Jun-21	9:49	10:20	NM, NZ	C04	542045	6989158	Explo	2200	2200	45	E	N	117	females with calves	11.6
5		12:17	12:47	NM, NZ	C05	544145	6982624	AWAR km 22	225	5	320	E	Y	3	females	11.5
6		13:44	14:14	NM, NZ	C06	543519	6984046	AWAR km 24	1030	1030	40	E	N	3	females	12
7		14:41	15:13	NM, NZ	C04	5042045	6989158	Explo	2200	2200	40	E	N	150	females with calves	11
8	29-Jun-21	17:18	17:48	NM	C09	541267	6988440	AWAR km 30, explo	1900	1000	180	W	Y	5000	females with calves	19
9		14:16	14:46	NM	C08	539672	6988266	TIRI1, AWAR km 28	2000	0	130	W	Y	5000	females with calves	18
10		12:12	12:42	NM	C07	542033	6989156	Explo	300	200	350	E	N	1	females	15
11		16:48	17:18	NM	C09	541267	6988440	AWAR km 30, explo	463	0	180	E	Y	5000	females with calves	19
12		13:30	14:00	NM	C08	539672	6988266	AWAR km 28, TIRI1	430	430	190	W	N	5000	females with calves	19
13		17:56	18:26	NM	C10	540326	6988058	AWAR km 28	1000	500	180	E	Y	500	mixed	19
14	30-Jun-21	11:49	12:22	NM, JR	C13	541794	6988900	Explo road	460	460	330	E	N	5	females with calves	11.5
15		10:57	11:33	NM, JR	C12	539232	6989153	Mine site	730	500	220	W	N	28	females with calves	12.5
16		14:15	14:45	NM, JR	C14	540865	6985852	AWAR km 27	708	330	160	W	N	2000	mixed group	10.4
17		8:54	9:25	NM, JR	C11	540825	6988994	Explo road	246	30	120	E	Y	17	mixed group	13.5
18		15:57	16:32	NM, JR	C16	543091	6984413	AWAR km 26	670	670	224	W	N	2000	mixed group	10.4
19		15:21	15:50	NM, JR	C15	542685	6984470	AWAR km 26	380	270	257	W	N	200	mixed group	11.5
20	1-Jul-21	10:33	11:05	NM, JR	C19	542809	6984429	AWAR km 24	202	0	300	E/W	Y	500	mixed gtoup	16.5
21		8:55	9:57	NM, JR	C18	543339	6984198	AWAR km 23	500	70	170	W	Y	60	females with calves	10.8
22		12:40	13:28	NM, JR	C20	542210	6984922	AWAR km 24	350	0	310	E/W	Y	275	mixed group	18
23		7:47	8:26	NM, JR	C17	540714	6985954	AWAR km 23	840	840	235	W	N	83	females with calves	10.5
24		8:38	9:08	NM, JR	C18	543339	6984198	AWAR km 23	234	150	85	E	N	2	females	10.8
25		12:02	12:32	NM, JR	C20	542210	6984922	AWAR km 24	350	0	310	E/W	Y	275	mixed group	18
26	2-Jul-21	10:23	10:53	NM, SK	C23	545579	6980741	AWAR km 20	213	175	320	W	N	107	females with calves	13.4
27		9:38	9:54	NM, SK	C22	547885	6976672	AWAR km 13	300	250	40	E	N	5	females with calves	14.4
28		8:02	8:40	NM, SK	C21	546154	6980043	AWAR km 19	1000	364	180	E	N	50	females with calves	8.8
29		14:31	15:01	NM, SK	C24	596294	6979469	AWAR km 17	800	800	175	W	N	2000	mixed group	17
30		13:45	14:15	NM, SK	C24	546294	6979469	AWAR km 17	375	375	214	W	N	2000	mixed group	17
31		15:58	16:28	NM, SK	C24	546294	6979469	AWAR km 17	800	800	214	W	N	2000	mixed group	17
32	3-Jul-21	13:16	13:46	NM, SJW, NAM	C29	543893	6983091	AWAR km 23	2400	2000	53	E	N	400	females with calves	11
33		7:16	7:45	NM, SJW, NAM	C23	545579	6980741	AWAR km 20	254	254	140	E	N	1	females	6
34		8:05	8:36	NM, SJW, NAM	C27	546955	6973703	AWAR km 11	271	220	270	W	N	1	females	6
35		9:06	9:37	NM, SJW, NAM	C28	543708	6983688	AWAR km 23	2600	2600	70	E	N	18	females with calves	8.7
36		17:12	17:42	NM	C30	543623	6983946	AWAR km 24	1600	1450	15	E	N	400	females with calves	12
37	4-Jul-21	14:36	15:06	NM, JR	C31	541658	6985365	AWAR km 27	790	25	309	E	N	2	females with calves	15.8
38	7-Jul-21	12:43	13:13	HV, JR	C32	546131	6980415	AWAR km 20	850	850	87	E	N	20	females with calves	14.7
39	8-Jul-21	7:25	7:36	HV, JR	C33	543663	6983817	AWAR km 25	818	818	113	E	N	3	females with calves	15.1
40	9-Jul-21	8:23	8:31	HV	C34	541195	6986436	AWAR km 28	25	0	10	W	Y	3	females	15
41		12:13	12:31	HV	C35	546141	6980387	AWAR km 20	515	515	80	E	N	2	females with calves	17
42	10-Jul-21	10:11	10:41	HV, SK	C36	540836	6988950	Explo Road/ WRSF 3	400	100	60	E	N	70	males	17
43		10:50	11:10	HV, SK	C36	540836	6988950	Explo Road/ WRSF 4	600	0	70	E	Y	70	males	17
44		13:27	13:57	HV, SK	C37	547845	6977612	AWAR km 16	1500	1300	270	W	N	4	males	19
45	12-Jul-21	13:13	13:43	HV	C38	543086	6984415	AWAR km 24	200	150	115	E	N	1	males	12
46		15:28	15:58	HV	C39	541492	6987160	AWAR km 28	450	90	185	E	N	275	mixed group	15

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Wind Speed (km/h)	Wind Direction	Days since Last Snow or Wind Event	Weather Observations	Road Open or Closed	Road Height	Road Side Width	Structures Present	Feeding_0	Lying Down_0	Standing_0	Walking_0	Alert_0	Trotting/Running_0	Photo Number_0	Comments_0
1	25-Jun-21	9:15	9:45	18	0	0	very windy cold day, overcast, no rain	open	N/A	N/A	mine site	19	6	0	0	0	0		
2	27-Jun-21	16:10	16:39	12	140	3	Light rain	open	150	200	AWAR, culvert	0	7	0	0	0	0		
3		11:24	11:54	9	90	3	warm, overcast, no rain	closed	N/A	N/A	mine site	0	0	0	0	1	0		
4	28-Jun-21	9:49	10:20	3.9	320	4	overcast	open	N/A	N/A	Explo camp	14	11	0	0	0	0		
5		12:17	12:47	4	320	4	overcast, no rain	open	100	200	AWAR, camera wpt 138	1	0	0	0	2	0		
6		13:44	14:14	5	320	4		open	100	200	AWAR	0	0	0	3	0	0		
7		14:41	15:13	6	320	4	overcast, no rain	open	N/A	N/A	Explo camp	7	18	0	0	0	0		
8	29-Jun-21	17:18	17:48	9.1	320	5	sunny, warm, wind picked up	closed	100	150	AWAR	19	0	10	0	1	0		
9		14:16	14:46	5.5	320	5	sunny	closed	100	150	AWAR, mine site	11	0	0	10	2	2		
10		12:12	12:42	7.4	320	5	clear, sunny	closed	N/A	N/A	mine, explo	0	1	0	0	0	0		
11		16:48	17:18	9.1	320	5	sunny, warm, wind picking up	closed	100	150	mine, AWAR	20	0	0	9	1	0		
12		13:30	14:00	1.2	320	5	warm, sunny, no insects yet	closed	N/A	N/A	mine, AWAR	16	4	0	5	0	0		
13		17:56	18:26	9	320	5	warm, sunny	closed	100	150	mine, AWAR	4	4	0	20	2	0		
14	30-Jun-21	11:49	12:22	18.9	220	6	sunny	closed	100	100	Explo camp	0	7	0	0	0	0		
15		10:57	11:33	13.7	220	6	sunny	closed	N/A	N/A	Waste rock pile, mine	5	23	0	0	0	0		
16		14:15	14:45	28.2	220	6	cloudy	closed	100	100	AWAR, quarry	14	3	0	2	0	1		
17		8:54	9:25	6.3	220	6	sunny	closed	100	100	waterline, road, mine	2	0	0	1	0	1		
18		15:57	16:32	25	140	6		closed	100	100	AWAR	7	1	0	10	0	2		
19		15:21	15:50	20.5	140	6	sunny	closed	100	100	AWAR	12	0	0	2	0	1		
20	1-Jul-21	10:33	11:05	5	180	7		closed	100	100	AWAR	16	3	0	0	0	3		
21		8:55	9:57	18.7	180	7	cloudy	closed	100	100	AWAR	9	0	0	9	0	5		
22		12:40	13:28	4.3	180	7		closed	100	100	AWAR	12	2	0	1	2	4		on road
23		7:47	8:26	8.8	180	7		closed	100	100	AWAR, quarry	12	0	0	5	3	0		
24		8:38	9:08	18.7	180	7	cloudy	closed	100	100	AWAR	2	0	0	0	0	0		
25		12:02	12:32	4.3	180	7	cloudy	closed	100	100	AWAR	11	3	0	6	0	1		group on road
26	2-Jul-21	10:23	10:53	9.8	320	7	sunny, heating up	closed	100	100	AWAR	22	0	0	4	0	0		
27		9:38	9:54	4.5	320	7	sunny	closed	100	100	AWAR	4	0	0	0	1	0		
28		8:02	8:40	13.5	320	7		closed			AWAR	21	3	0	3	2	1		
29		14:31	15:01	16.5	320	7	sunny, windy	closed	100	100	AWAR	4	0	1	25	0	0		
30		13:45	14:15	16.5	320	7		closed	100	100	AWAR	12	1	2	15	0	0		group in lowland area below road
31		15:58	16:28	16.5	320	7		closed			AWAR	5	0	5	5	15	0		
32	3-Jul-21	13:16	13:46	4.4	20	0	overcast	open			AWAR	7	0	0	13	0	0		
33		7:16	7:45	9.5	0	0	fog	closed			AWAR	1	0	0	0	0	0		
34		8:05	8:36	3.8	0	0	overcast	closed			AWAR	0	0	0	1	0	0		1 additional caribou observed to east, not behaviourally linked
35		9:06	9:37	8.5	0	0	overcast	closed			AWAR	9	2	0	3	0	0		
36		17:12	17:42	6.6	320	0		closed			AWAR	12	0	0	6	0	2		hunters on hill overlooking
37	4-Jul-21	14:36	15:06	6.4	180	1		open			AWAR, quarry	0	0	0	0	0	2		
38	7-Jul-21	12:43	13:13	20.5	300	4	very light rain right before survey	open			AWAR	2	18	0	0	0	0		
39	8-Jul-21	7:25	7:36	2.2	0	5		open			AWAR	0	0	0	0	0	3		
40	9-Jul-21	8:23	8:31	2	0	6	sunny	open			AWAR	0	0	0	0	0	3		crossing AWAR W to E
41		12:13	12:31	25	250	6		open			AWAR	2	0	0	0	0	0		
42	10-Jul-21	10:11	10:41	2.7	130	7		open			WRSF 3, Explo Camp, Waterline	30	0	0	0	0	0		group is E of explo camp and waterline
43		10:50	11:10	3	130	7		closed			WRSF 3, Explo Camp, Waterline	0	0	0	30	0	0		
44		13:27	13:57	15.5	180	7		closed			AWAR	0	4	0	0	0	0		looks like there are maybe 1-2 more males but they are behind a hill
45	12-Jul-21	13:13	13:43	60	45	0	rained overnight, foggy today and high winds starting in afternoon	open			AWAR	0	0	0	1	0	0		headed N/NE away from road
46		15:28	15:58	65	0	0	light rain on/off, high winds	closed			AWAR	5	7	0	15	3	0		two hunters watching herd

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Feeding_3	Lying down_3	Standing_3	Walking_3	Alert_3	Trotting/Running_3	Photo Number_3	Comments_3	Feeding_6	Lying down_6	Standing_6	Walking_6	Alert_6	Trotting/Running_6	Photo Number_6	Comments_6
1	25-Jun-21	9:15	9:45	19	6	0	0	0	0			20	0	2	3	0	0		
2	27-Jun-21	16:10	16:39	0	0	0	0	7	0		pick up truck driving by and caribou still lying down	0	7	0	0	0	0		
3		11:24	11:54	1	0	0	0	0	0			1	0	0	0	0	0		
4	28-Jun-21	9:49	10:20	8	16	0	1	0	0			12	13	0	0	0	0		
5		12:17	12:47	1	0	0	1	1	0			0	0	0	1	2	0		
6		13:44	14:14	0	0	0	3	0	0			3	0	0	0	0	0		
7		14:41	15:13	10	15	0	0	0	0			8	17	0	0	0	0		
8	29-Jun-21	17:18	17:48	0	0	0	0	0	30		ATV	5	0	0	15	0	10		majority of group out of sight
9		14:16	14:46	15	0	0	9	0	1			15	0	0	7	2	1		
10		12:12	12:42	0	0	0	0	1	0			0	1	0	0	0	0		
11		16:48	17:18	20	0	0	10	1	0		crossing over road into view from east	23	0	0	4	0	3		crossing over road into view from east
12		13:30	14:00	15	3	0	7	0	0			20	2	0	3	0	0		
13		17:56	18:26	1	4	0	21	4	0		convoy slowly approaching	4	6	0	12	2	6		crossing road
14	30-Jun-21	11:49	12:22	0	7	0	0	0	0			0	7	0	0	0	0		
15		10:57	11:33	5	23	0	0	0	0			6	18	0	0	0	0		
16		14:15	14:45	13	1	0	0	1	0			16	4	0	0	0	0		
17		8:54	9:25	2	0	0	1	1	0			6	0	0	2	1	0		
18		15:57	16:32	12	5	0	3	0	0			15	3	0	2	0	0		
19		15:21	15:50	13	0	0	1	2	0			6	0	0	7	2	2		
20	1-Jul-21	10:33	11:05	13	2	0	4	0	1			17	3	0	1	0	0		
21		8:55	9:57	7	0	0	1	2	10		crossing road	1	0	0	9	2	8		crossing/travelling on road
22		12:40	13:28	0	0	0	0	2	18		group running for entire 3 minute interval, truck proceeding slowly	1	0	0	0	5	14		
23		7:47	8:26	14	0	0	3	3	0			17	1	1	1	1	0		group merged into larger group of ~300
24		8:38	9:08	0	1	0	0	1	0			2	0	0	0	0	0		
25		12:02	12:32	10	1	1	8	0	0			11	1	0	4	0	4		
26	2-Jul-21	10:23	10:53	16	0	0	6	3	0			16	0	0	17	0	1		
27		9:38	9:54	3	0	0	1	1	0			4	0	0	0	1	0		
28		8:02	8:40	27	1	0	2	1	0			26	1	0	2	0	1		
29		14:31	15:01	3	0	0	25	4	0			0	1	0	1	5	25		one caribou shot down, possibly one wounded
30		13:45	14:15	25	1	2	3	0	0			19	3	0	8	0	0		
31		15:58	16:28	5	0	0	5	10	15			0	0	0	0	0	30		
32	3-Jul-21	13:16	13:46	14	0	0	4	0	2			14	0	0	6	0	0		
33		7:16	7:45	1	0	0	0	0	0			0	0	0	1	0	0		
34		8:05	8:36	0	1	0	0	0	0		additional caribou behind survey crossed road towards this caribou	1	0	0	0	0	0		
35		9:06	9:37	12	0	0	1	1	0			8	0	0	4	0	0		3 out of sight
36		17:12	17:42	12	0	0	2	0	4			16	0	0	4	0	0		
37	4-Jul-21	14:36	15:06	0	0	0	0	0	2			0	0	0	0	0	2		
38	7-Jul-21	12:43	13:13	1	18	0	0	0	0		one out of sight	3	17	0	0	0	0		
39	8-Jul-21	7:25	7:36	1	0	0	0	0	2		moving E, away from road	0	0	2	0	0	0		>1 km away
40	9-Jul-21	8:23	8:31	0	0	0	0	0	3		Running S	3	0	0	0	0	0		
41		12:13	12:31	2	0	0	0	0	0			2	0	0	0	0	0		
42	10-Jul-21	10:11	10:41	30	0	0	0	0	0			25	0	0	5	0	0		
43		10:50	11:10	15	0	0	15	0	0		looking for way across waterline	15	0	0	15	0	0		
44		13:27	13:57	0	4	0	0	0	0			0	4	0	0	0	0		
45	12-Jul-21	13:13	13:43	1	0	0	0	0	0			0	0	0	0	0	1		
46		15:28	15:58	15	5	0	10	0	0		moving W slowly towards road	15	5	0	10	0	o		moving E, away from road

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Feeding_9	Lying Down_9	Standing_9	Walking_9	Alert_9	Trotting/Running_9	Comments_9	Photo Number_9	Feeding_12	Lying Down_12	Standing_12	Walking_12	Alert_12	Trotting/Running_12	Photo Number_12	Comments_12
1	25-Jun-21	9:15	9:45	18	5	1	1	0	0			16	7	1	1	0	0		
2	27-Jun-21	16:10	16:39	0	7	0	0	0	0			0	0	0	0	7	0		five stood up, all alert
3		11:24	11:54	0	0	0	1	0	0	walking out of sight		0	0	0	1	0	0		walking out of sight
4	28-Jun-21	9:49	10:20	11	9	0	4	0	0			9	14	0	2	0	0		
5		12:17	12:47	0	0	0	1	2	0	crossing road		2	0	0	0	1	0		crossing road, shaking heads from insects
6		13:44	14:14	1	0	0	1	0	1			0	0	0	1	1	1		
7		14:41	15:13	9	11	0	5	0	0			6	19	0	0	0	0		
8	29-Jun-21	17:18	17:48	11	0	0	15	0	4	surveying segment further away		10	0	0	20	0	0		
9		14:16	14:46	20	0	0	5	0	0			10	0	0	10	0	5		
10		12:12	12:42	0	1	0	0	0	0			0	1	0	0	0	0		
11		16:48	17:18	19	0	0	7	0	4	crossing over road into view from east		19	0	0	9	1	1		stopping to look around on the road
12		13:30	14:00	16	4	0	4	1	0			13	5	1	5	1	0		
13		17:56	18:26	3	0	0	20	3	4	crossing road		0	0	0	26	4	0		crossing road
14	30-Jun-21	11:49	12:22	0	7	0	0	0	0			0	7	0	0	0	0		
15		10:57	11:33	4	23	0	1	0	0			3	20	0	3	0	0		
16		14:15	14:45	16	3	0	1	0	0			13	1	0	2	2	2		
17		8:54	9:25	10	0	0	0	0	0			8	0	0	0	2	0		
18		15:57	16:32	15	1	0	2	1	1			4	3	0	7	3	2		
19		15:21	15:50	12	0	0	2	0	0			8	0	0	1	1	0		
20	1-Jul-21	10:33	11:05	16	2	0	1	1	0			8	1	0	8	3	0		
21		8:55	9:57	1	0	0	3	2	9			8	0	0	6	0	7		
22		12:40	13:28	0	0	0	0	0	20			1	0	0	4	0	15		
23		7:47	8:26	18	0	0	1	1	0			17	2	0	1	0	0		
24		8:38	9:08	0	0	0	0	0	2			1	1	0	0	0	0		
25		12:02	12:32	13	3	1	2	1	0			10	2	2	6	1	0		
26	2-Jul-21	10:23	10:53	18	0	2	18	2	0			25	0	1	16	1	2		
27		9:38	9:54	0	0	0	2	0	3			0	0	0	1	0	4		
28		8:02	8:40	18	1	0	2	1	0			25	1	0	4	0	0		
29		14:31	15:01	20	0	0	12	5	0			26	1	0	0	3	0		3 caribou watching hunter
30		13:45	14:15	23	4	1	3	0	0			16	13	0	0	5	0		
31		15:58	16:28	0	0	0	0	0	30			0	0	0	0	0	30		
32	3-Jul-21	13:16	13:46	10	0	0	6	0	4			12	1	0	6	0	1		
33		7:16	7:45	0	0	0	0	1	0			0	0	0	0	0	1		
34		8:05	8:36	1	0	0	0	0	0			1	0	0	0	0	0		
35		9:06	9:37	10	1	0	0	0	0			9	1	0	1	1	0		
36		17:12	17:42	4	0	0	6	2	10			5	0	0	10	2	3		
37	4-Jul-21	14:36	15:06	0	0	0	0	0	2			0	0	0	0	1	1		
38	7-Jul-21	12:43	13:13	3	17	0	0	0	0			4	8	0	4	3	0		
39	8-Jul-21	7:25	7:36	0	0	1	0	0	0	out of sight		0	0	0	0	0	0		out of sight
40	9-Jul-21	8:23	8:31	0	0	0	0	0	3	running S out of sight		0	0	0	0	0	0		out of sight
41		12:13	12:31	1	0	0	1	0	0	walking south slowly		2	0	0	0	0	0		
42	10-Jul-21	10:11	10:41	5	0	0	20	5	0			0	0	0	30	0	0		
43		10:50	11:10	0	0	0	30	0	0			0	0	0	25	0	5		
44		13:27	13:57	0	3	1	0	0	0			0	2	2	0	0	0		
45	12-Jul-21	13:13	13:43	1	0	0	0	0	0			0	0	0	1	0	0		headed East, away from road
46		15:28	15:58	22	3	0	5	0	0			20	10	0	0	0	0		

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Feeding_15	Lying Down_15	Standing_15	Walking_15	Alert_15	Trotting/Running_15	Photo Number_15	Comments_15	Feeding_18	Lying Down_18	Standing_18	Walking_18	Alert_18	Trotting/Running_18	Photo Number_18	Comments_18
1	25-Jun-21	9:15	9:45	16	7	1	1	0	0			15	8	0	2	0	0		
2	27-Jun-21	16:10	16:39	0	7	0	0	0	0			0	1	0	0	6	0		
3		11:24	11:54	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
4	28-Jun-21	9:49	10:20	8	16	0	1	0	0			7	18	0	0	0	0		
5		12:17	12:47	3	0	0	0	0	0			0	0	0	0	0	3		
6		13:44	14:14	0	0	0	1	2	0			0	0	0	0	0	3		
7		14:41	15:13	12	13	0	0	0	0			10	15	0	0	0	0		
8	29-Jun-21	17:18	17:48	15	0	0	10	0	5			15	0	0	13	1	0		
9		14:16	14:46	15	0	0	8	1	1		small group running	1	0	0	20	0	5		on the move
10		12:12	12:42	0	1	0	0	0	0			0	1	0	0	0	0		
11		16:48	17:18	17	0	0	3	0	0			20	0	0	8	2	1		
12		13:30	14:00	16	7	1	1	0	0			19	6	0	0	0	0		
13		17:56	18:26	4	3	0	30	0	0			10	0	0	20	2	0		HTO truck visible -> not moving
14	30-Jun-21	11:49	12:22	1	6	0	0	0	0			0	7	0	0	0	0		
15		10:57	11:33	6	8	0	8	2	0			10	13	1	3	0	0		
16		14:15	14:45	4	0	0	0	6	10			0	0	0	0	0	0		survey interrupted by conversation with local on ATV
17		8:54	9:25	12	0	0	0	1	0			10	0	0	0	1	0		
18		15:57	16:32	16	0	0	2	1	1			15	3	0	2	0	2		
19		15:21	15:50	8	0	0	1	2	0		main group out of site	3	0	0	1	1	0		
20	1-Jul-21	10:33	11:05	11	3	2	2	0	2			14	1	1	3	1	0		
21		8:55	9:57	2	0	0	10	0	3			7	0	0	6	2	2		still walking on road
22		12:40	13:28	0	0	0	10	0	10			1	0	0	15	0	6		
23		7:47	8:26	18	1	0	0	1	0			19	1	0	4	1	0		
24		8:38	9:08	1	1	0	0	0	0			0	2	0	0	0	0		
25		12:02	12:32	14	3	1	1	1	0			14	3	2	1	0	0		
26	2-Jul-21	10:23	10:53	14	0	0	22	3	0			5	0	0	31	0	0		
27		9:38	9:54	1	0	0	2	0	2			0	0	0	0	0	5		running out of sight
28		8:02	8:40	20	2	0	4	0	1			23	3	0	4	0	0		
29		14:31	15:01	26	0	0	0	2	2			27	1	1	0	0	1		1 panicked caribou running around hunter
30		13:45	14:15	18	12	1	1	0	0			13	8	3	10	3	0		
31		15:58	16:28	0	0	0	0	0	30			5	0	0	0	2	23		
32	3-Jul-21	13:16	13:46	15	1	0	4	0	0			18	2	0	0	0	0		
33		7:16	7:45	0	0	0	0	1	0			0	0	0	1	0	0		
34		8:05	8:36	1	0	0	0	0	0			1	0	0	0	0	0		
35		9:06	9:37	14	1	0	1	0	0			13	0	0	1	0	1		
36		17:12	17:42	0	0	0	9	5	6			0	0	0	0	10	10		shots fired? Some of group looking back
37	4-Jul-21	14:36	15:06	0	0	0	0	0	2			0	0	0	0	0	2		running out of sight
38	7-Jul-21	12:43	13:13	11	10	0	2	0	0			0	6	0	3	4	0		moving south/southwest, can't see all of them
39	8-Jul-21	7:25	7:36	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
40	9-Jul-21	8:23	8:31	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
41		12:13	12:31	0	0	0	2	0	0		walked southeast	2	0	0	0	0	0		
42	10-Jul-21	10:11	10:41	1	0	0	29	0	0		circling around water pipeline area	27	0	0	3	0	0		
43		10:50	11:10	16	0	0	10	4	0		circling around water pipeline area	0	0	0	30	0	0		group crossed waterline at S ramp at 17min
44		13:27	13:57	0	4	0	0	0	0			0	4	0	0	0	0		
45	12-Jul-21	13:13	13:43	1	0	0	0	0	0			0	0	0	1	0	0		
46		15:28	15:58	15	13	0	2	0	0			10	20	0	0	0	0		

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Feeding_21	Lying Down_21	Standing_21	Walking_21	Alert_21	Trotting/Running_21	Photo Number_21	Comments_21	Feeding_24	Lying Down_24	Standing_24	Walking_24	Alert_24	Trotting/Running_24	Photo Number_24	Comments_24
1	25-Jun-21	9:15	9:45	15	8	0	1	1	0			15	7	0	3	0	0		
2	27-Jun-21	16:10	16:39	0	7	0	0	0	0			0	7	0	0	0	0		
3		11:24	11:54	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
4	28-Jun-21	9:49	10:20	7	18	0	0	0	0			2	23	0	0	0	0		
5		12:17	12:47	1	0	0	0	2	0			0	0	0	0	0	3		
6		13:44	14:14	0	0	0	0	0	3			0	0	0	3	0	0		
7		14:41	15:13	7	18	0	0	0	0			9	15	0	0	1	0		
8	29-Jun-21	17:18	17:48	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
9		14:16	14:46	11	0	0	9	0	5			10	0	0	3	1	10		
10		12:12	12:42	1	0	0	0	0	0			0	1	0	0	0	0		
11		16:48	17:18	25	0	0	3	2	0			24	0	0	5	1	0		
12		13:30	14:00	14	6	1	2	1	0			15	8	0	3	0	0		
13		17:56	18:26	6	0	0	20	4	0			0	0	0	26	4	0		
14	30-Jun-21	11:49	12:22	0	7	0	0	0	0			0	7	0	0	0	0		
15		10:57	11:33	7	16	0	0	1	0			6	21	0	0	0	0		
16		14:15	14:45	0	0	0	0	0	0		survey interrupted by conversation with local on ATV	0	0	0	20	0	0		
17		8:54	9:25	8	0	0	0	3	0			10	0	0	1	0	0		
18		15:57	16:32	16	5	0	1	1	0			17	2	0	2	0	0		
19		15:21	15:50	16	0	0	10	4	0			14	0	0	0	1	2		1 nursing
20	1-Jul-21	10:33	11:05	15	2	0	2	0	1			15	2	0	1	2	0		
21		8:55	9:57	6	0	0	12	2	0			6	0	0	13	0	3		most have crossed road W to E
22		12:40	13:28	1	0	0	8	1	4		group going out of sight - appear to be relocating following disturbance	0	0	0	5	0	15		
23		7:47	8:26	11	0	2	6	1	2			17	1	0	2	0	0		
24		8:38	9:08	0	2	0	0	0	0			0	2	0	0	0	0		
25		12:02	12:32	12	8	0	0	3	0			12	6	1	2	0	0		
26	2-Jul-21	10:23	10:53	8	0	1	5	2	10		convoy approaching	13	0	0	16	4	8		
27		9:38	9:54	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
28		8:02	8:40	15	2	0	7	0	0			23	2	0	5	0	0		
29		14:31	15:01	27	1	0	1	0	1		1 panicked caribou running around hunter	30	2	0	0	0	1		1 panicked caribou running around hunter
30		13:45	14:15	14	10	2	4	0	0			10	18	0	0	2	0		
31		15:58	16:28	0	0	0	4	0	26			3	0	0	12	0	15		
32	3-Jul-21	13:16	13:46	15	0	0	5	0	0			17	2	0	1	0	0		
33		7:16	7:45	1	0	0	0	0	0			0	0	0	0	0	1		running out of sight
34		8:05	8:36	1	0	0	0	0	0			0	0	0	0	1	0		
35		9:06	9:37	11	0	0	2	0	0			11	1	0	1	0	0		
36		17:12	17:42	4	0	0	10	0	6			4	0	0	8	0	8		
37	4-Jul-21	14:36	15:06	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
38	7-Jul-21	12:43	13:13	5	0	0	5	1	0			0	0	0	15	0	1		two males with antlers, at least 5 calves
39	8-Jul-21	7:25	7:36	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
40	9-Jul-21	8:23	8:31	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
41		12:13	12:31	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
42	10-Jul-21	10:11	10:41	15	0	0	15	0	0			9	0	0	20	1	0		
43		10:50	11:10	0	0	0	0	0	30		group ran as soon as across waterline	2	0	0	0	0	0		two did not make it across ramp, still near explo camp. All others out of site.
44		13:27	13:57	0	4	0	0	0	0			0	4	0	0	0	0		
45	12-Jul-21	13:13	13:43	1	0	0	0	0	0		stopped ~ 1 km E of the road	1	0	0	0	0	0		
46		15:28	15:58	7	23	0	0	0	0			5	24	0	0	1	0		not sure why some are alert now

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Feeding_27	Lying Down_27	Standing_27	Walking_27	Alert_27	Trotting/Running_27	Photo Number_27	Comments_27	Feeding_30	Lying Down_30	Standing_30	Walking_30	Alert_30	Trotting/Running_30	Photo Number_30	Comments_30
1	25-Jun-21	9:15	9:45	13	11	0	1	0	0			18	5	0	2	0	0		
2	27-Jun-21	16:10	16:39	0	7	0	0	0	0			0	0	0	0	7	0		
3		11:24	11:54	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		
4	28-Jun-21	9:49	10:20	3	22	0	0	0	0			4	21	0	0	0	0		
5		12:17	12:47	0	0	0	0	0	3			0	0	0	0	0	3		ran out of sight
6		13:44	14:14	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
7		14:41	15:13	9	13	0	2	1	0			7	17	0	1	0	0		
8	29-Jun-21	17:18	17:48	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
9		14:16	14:46	12	0	0	13	0	0			12	0	0	12	0	2		
10		12:12	12:42	0	1	0	0	0	0			0	1	0	0	0	0		
11		16:48	17:18	25	3	0	4	1	0			28	3	0	3	0	0		
12		13:30	14:00	16	6	0	2	1	0		1 nursing	15	6	0	2	0	1		
13		17:56	18:26	0	0	0	26	4	0		caribou going along road	10	0	0	20	0	0		
14	30-Jun-21	11:49	12:22	3	2	2	0	0	0			3	3	1	0	0	0		1 nursing
15		10:57	11:33	8	21	0	0	0	0			5	20	0	1	1	0		
16		14:15	14:45	0	0	0	20	0	0			5	0	0	15	0	0		
17		8:54	9:25	10	0	0	0	1	0			10	0	0	0	1	0		
18		15:57	16:32	15	3	0	3	0	0			14	2	0	3	0	1		
19		15:21	15:50	4	0	0	15	2	1			3	0	0	0	0	0		
20	1-Jul-21	10:33	11:05	16	4	1	3	0	0			15	3	0	0	3	0		
21		8:55	9:57	10	0	0	7	2	1			12	0	0	8	0	0		
22		12:40	13:28	1	0	0	5	0	15			0	0	0	15	0	5		
23		7:47	8:26	19	2	0	0	0	0			16	2	1	0	1	0		
24		8:38	9:08	0	2	0	0	0	0			0	2	0	0	0	0		
25		12:02	12:32	12	8	0	1	0	0			10	9	0	1	1	0		group still on road
26	2-Jul-21	10:23	10:53	5	0	0	35	0	6			4	0	0	29	2	4		
27		9:38	9:54	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
28		8:02	8:40	25	3	0	2	0	0			20	5	0	8	0	0		
29		14:31	15:01	30	0	1	0	0	0			27	2	0	0	1	0		
30		13:45	14:15	10	20	0	0	0	1			6	23	0	1	0	0		
31		15:58	16:28	6	0	0	11	0	14			10	0	0	12	1	7		
32	3-Jul-21	13:16	13:46	16	1	0	3	0	0			17	2	0	1	0	0		
33		7:16	7:45	0	0	0	0	1	0			0	0	0	0	0	0		out of sight
34		8:05	8:36	1	0	0	0	0	0			1	0	0	0	0	0		
35		9:06	9:37	12	1	0	4	0	1			14	0	0	3	0	0		
36		17:12	17:42	6	0	0	10	0	4			10	0	0	4	2	4		
37	4-Jul-21	14:36	15:06	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
38	7-Jul-21	12:43	13:13	0	0	0	7	0	0		rest out of sight	0	0	0	2	0	0		out of sight
39	8-Jul-21	7:25	7:36	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
40	9-Jul-21	8:23	8:31	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
41		12:13	12:31	0	0	0	0	0	0		out of sight	0	0	0	0	0	0		out of sight
42	10-Jul-21	10:11	10:41	30	0	0	0	0	0			0	0	0	10	0	20		
43		10:50	11:10	2	0	0	0	0	0		two left behind	2	0	0	0	0	0		
44		13:27	13:57	0	4	0	0	0	0			0	4	0	0	0	0		
45	12-Jul-21	13:13	13:43	1	0	0	0	0	0	truck drove by, no reaction		0	0	0	1	0	0		
46		15:28	15:58	3	27	0	0	0	0			0	15	0	0	15	0		Hop ~150m away, walking around to pick up plastic and alerted herd. Group trotted away after this.

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Disturbance_0	Dist_comments_0	Disturbance_3	Dist_comments_3	Disturbance_6	Dist_comments_6
1	25-Jun-21	9:15	9:45						
2	27-Jun-21	16:10	16:39			Light truck	two		
3		11:24	11:54	Hyster	noise from mine site	Hyster	noise from mine site	Hyster	noise from mine site
4	28-Jun-21	9:49	10:20						
5		12:17	12:47					Arctic fox	Arctic fox interacting with caribou.
6		13:44	14:14						
7		14:41	15:13						
8	29-Jun-21	17:18	17:48			ATV	blasted thru caribou herd caribou scattered everywhere		
9		14:16	14:46						
10		12:12	12:42			Light Truck	my vehicle -> turning off engine caught her attention		
11		16:48	17:18						
12		13:30	14:00						
13		17:56	18:26						
14	30-Jun-21	11:49	12:22						
15		10:57	11:33						
16		14:15	14:45						
17		8:54	9:25						
18		15:57	16:32						
19		15:21	15:50						
20	1-Jul-21	10:33	11:05						
21		8:55	9:57						
22		12:40	13:28	Light Truck	Proceeding slowly on road at 5km/hr	Light Truck	Proceeding slowly on road at 5 km/hr	Light Truck	at 8 minutes - Proceeding slowly on road at 5km/hr
23		7:47	8:26						
24		8:38	9:08					Light truck	
25		12:02	12:32						
26	2-Jul-21	10:23	10:53						
27		9:38	9:54						
28		8:02	8:40						
29		14:31	15:01	ATV	slowly approaching herd off road			hunter	3 gunshots, one caribou killed
30		13:45	14:15	Light truck	our truck, upwind				
31		15:58	16:28	convoy	approaching at 5 km/h	convoy	3 pickups, 7 buses, 2 hinos, 2 tractor trailors	convoy	passing slowly
32	3-Jul-21	13:16	13:46						
33		7:16	7:45						
34		8:05	8:36						
35		9:06	9:37						
36		17:12	17:42			ATV	2 side by sides. Stopped @ km 24	ATV	3 approaching herd
37	4-Jul-21	14:36	15:06	Light truck	Surveyor truck approaching				
38	7-Jul-21	12:43	13:13						
39	8-Jul-21	7:25	7:36						
40	9-Jul-21	8:23	8:31	Light truck	Survey vehicle approaching, group was already running when				
41		12:13	12:31						
42	10-Jul-21	10:11	10:41						
43		10:50	11:10						
44		13:27	13:57						
45	12-Jul-21	13:13	13:43						
46		15:28	15:58						

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Disturbance_9	Dist_comments_9	Disturbance_12	Dist_comments_12	Disturbance_15	Dist_comments_15
1	25-Jun-21	9:15	9:45						
2	27-Jun-21	16:10	16:39			ATV	three	ATV	two, far away
3		11:24	11:54	Hyster	noise from mine site				
4	28-Jun-21	9:49	10:20						
5		12:17	12:47						
6		13:44	14:14					Convoy	4 buses, 2 pickups, 4 hinos
7		14:41	15:13						
8	29-Jun-21	17:18	17:48						
9		14:16	14:46						
10		12:12	12:42						
11		16:48	17:18						
12		13:30	14:00	Light truck	Sean's truck leaving survey site. 11 minutes				
13		17:56	18:26	light truck	HTO advance truck ahead of convoy				
14	30-Jun-21	11:49	12:22						
15		10:57	11:33						
16		14:15	14:45					ATV	
17		8:54	9:25						
18		15:57	16:32	ATV					
19		15:21	15:50						
20	1-Jul-21	10:33	11:05						
21		8:55	9:57						
22		12:40	13:28						
23		7:47	8:26						
24		8:38	9:08						
25		12:02	12:32						
26	2-Jul-21	10:23	10:53						
27		9:38	9:54						
28		8:02	8:40						
29		14:31	15:01						
30		13:45	14:15			ATV	two, stopping by herd		
31		15:58	16:28			ATV	two		
32	3-Jul-21	13:16	13:46			ATV	approaching slowly		
33		7:16	7:45					Light truck	surveyor truck approaching caribou
34		8:05	8:36						
35		9:06	9:37						
36		17:12	17:42	ATV	2 side by sides moving again			hunter	Approaching herd, shots fired
37	4-Jul-21	14:36	15:06						
38	7-Jul-21	12:43	13:13			ATV	two passed by on the road, about 30 sec apart.		
39	8-Jul-21	7:25	7:36						
40	9-Jul-21	8:23	8:31						
41		12:13	12:31						
42	10-Jul-21	10:11	10:41	Light truck	truck on explo road at 7 min, whole group started running				
43		10:50	11:10						
44		13:27	13:57						
45	12-Jul-21	13:13	13:43						
46		15:28	15:58						

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Disturbance_18	Dist_comments_18	Disturbance_21	Dist_comments_21	Disturbance_24	Dist_comments_24
1	25-Jun-21	9:15	9:45						
2	27-Jun-21	16:10	16:39	ATV	one				
3		11:24	11:54						
4	28-Jun-21	9:49	10:20						
5		12:17	12:47					ATV	
6		13:44	14:14						
7		14:41	15:13						
8	29-Jun-21	17:18	17:48						
9		14:16	14:46						
10		12:12	12:42						
11		16:48	17:18						
12		13:30	14:00						
13		17:56	18:26						
14	30-Jun-21	11:49	12:22						
15		10:57	11:33						
16		14:15	14:45						
17		8:54	9:25						
18		15:57	16:32						
19		15:21	15:50						
20	1-Jul-21	10:33	11:05						
21		8:55	9:57			Light truck			
22		12:40	13:28						
23		7:47	8:26						
24		8:38	9:08						
25		12:02	12:32						
26	2-Jul-21	10:23	10:53			convoy	approaching slowly: 3 light trucks, 7 bus, 2 hino, 2 tractor trailer		
27		9:38	9:54						
28		8:02	8:40						
29		14:31	15:01						
30		13:45	14:15	ATV	two, leaving, downwind from herd			hunter	gunshot @ 25 minutes and 26 minutes, downwind from caribou so they barely reacted
31		15:58	16:28	hunter	shots fired				
32	3-Jul-21	13:16	13:46						
33		7:16	7:45						
34		8:05	8:36						
35		9:06	9:37						
36		17:12	17:42						
37	4-Jul-21	14:36	15:06						
38	7-Jul-21	12:43	13:13						
39	8-Jul-21	7:25	7:36						
40	9-Jul-21	8:23	8:31						
41		12:13	12:31						
42	10-Jul-21	10:11	10:41						
43		10:50	11:10						
44		13:27	13:57						
45	12-Jul-21	13:13	13:43						
46		15:28	15:58						

Appendix B: Caribou Behaviour Monitoring Data Sheet

Survey ID	Date	Time Start	Time End	Disturbance_27	Dist_comments_27	Disturbance_30	Dist_comments_30	General_comments
1	25-Jun-21	9:15	9:45					
2	27-Jun-21	16:10	16:39	ATV and Light Truck	at 29 minutes			One individual out of sight for duration of survey but with group
3		11:24	11:54					
4	28-Jun-21	9:49	10:20					
5		12:17	12:47					
6		13:44	14:14					
7		14:41	15:13					
8	29-Jun-21	17:18	17:48					
9		14:16	14:46					convoy waiting @ km 21 -> this survey was for the lead group on the road @ km 28
10		12:12	12:42					
11		16:48	17:18					front of herd, only surveying what I could see - rest out of view
12		13:30	14:00					
13		17:56	18:26					
14	30-Jun-21	11:49	12:22	Sewage truck				
15		10:57	11:33					
16		14:15	14:45					
17		8:54	9:25					
18		15:57	16:32					group across lake from surveyor - may have altered response
19		15:21	15:50					
20	1-Jul-21	10:33	11:05					
21		8:55	9:57					
22		12:40	13:28					kept watching: at 33 minutes 15 walking and 5 running; at 36 minutes 10 walking, 3 alert, and 4 running. Group then out of sight.
23		7:47	8:26					
24		8:38	9:08					
25		12:02	12:32					
26	2-Jul-21	10:23	10:53					
27		9:38	9:54					
28		8:02	8:40					
29		14:31	15:01					
30		13:45	14:15					
31		15:58	16:28					
32	3-Jul-21	13:16	13:46					
33		7:16	7:45					
34		8:05	8:36					
35		9:06	9:37			ATV	driving	
36		17:12	17:42					
37	4-Jul-21	14:36	15:06					
38	7-Jul-21	12:43	13:13					at least 5-6 calves out of group of 20, two males with large antlers also in the group.
39	8-Jul-21	7:25	7:36					
40	9-Jul-21	8:23	8:31					one caribou looked smaller than the other two, but not small enough to be a new calf.
41		12:13	12:31					
42	10-Jul-21	10:11	10:41	Light truck	second truck on explo road at 25 min			
43		10:50	11:10					SAME group surveyed again, continued surveying as group looked for crossing at waterline.
44		13:27	13:57					
45	12-Jul-21	13:13	13:43					
46		15:28	15:58			Human	Hop got out of truck to pick up plastic on the side of the road, caribou moved away and shortly after ran towards Explo camp.	

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APPENDIX F

Meliadine Project Caribou Trail Camera Study, 2021

Meliadine Project

Caribou Trail Camera Study, 2021

January 2022

Project No.: 0605387-3

The business of sustainability

January 2022

Meliadine Project

Caribou Trail Camera Study, 2021

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EXECUTIVE SUMMARY

The Meliadine Mine (the Project), owned and operated by Agnico Eagle Mines Limited (Agnico Eagle), is located on Inuit Owned Land (IOL) approximately 25 km north of Rankin Inlet, Nunavut. A 34 km all weather access road (AWAR) connects the Project to Rankin Inlet. During July each year, groups of Qamanirjuaq caribou occur in the Project area, regularly crossing through the Project site and the AWAR.

In 2020 and 2021, a study was conducted using motion-trigger cameras to study caribou interactions with the Project infrastructure during their annual migration, and particularly the AWAR. The study was designed to identify features of the AWAR (i.e., slope, substrate, height, and surrounding habitat) that may facilitate higher rates of caribou passage. Cameras were also placed at locations identified by community members and Inuit Elders from Inuit Qaujimajatuqangit (IQ) where caribou more frequently crossed the road. The survey protocol in 2021 followed that used in 2020, with minor improvements intended to increase the reliability of results.

This study was completed in accordance with the Meliadine Mine Nunavut Impact Review Board (NIRB) Project Certificate (#006) and commitments made by Agnico Eagle to document and assess whether or not caribou movement near the Project Area is affected by Project infrastructure.

Twenty-seven cameras were placed along the AWAR in mid June 2021, and were removed in mid July. Cameras were placed approximately 2 metres west of the AWAR, facing north; and took both timed and motion-triggered photos. Road survey data from 2020 was used and included; height above tundra, width, side-slope, surfacing material (esker vs. quarry rock, and size), and surrounding vegetation type. Four cameras were spaced in quarters along the AWAR and set up facing the road to specifically capture vehicle passage. These cameras were analysed for vehicle traffic.

Overall, the key findings from the camera study included:

- The cameras were successful at capturing many caribou crossing the AWAR, with peak caribou passage occurring one week earlier in 2021 vs 2020, consistent with patterns of inter-annual variability observed in the collar data.
- Caribou crossing timing and locations in 2021 were consistent with locations identified in 2020 and with locations identified by IQ from Inuit Elders and community members. The hotspots identified by the camera data in both 2020 and 2021 aligned more closely with the IQ identified hotspots than the collar data from 2012-2019.
- Road height and road-side slope at each camera location was not related to the number of caribou observed with each camera, suggesting that differences in the structure of the AWAR road was not influencing the locations where caribou cross the road. Alternatively, since the structure of the road is relatively uniform along its length, there may not be enough difference in the shape or profile of the road to influence which sections of the road caribou prefer to cross.
- More caribou were observed on cameras on the northern half of the road. Esker material is more common as a substrate on the northern half of the road which may suggest caribou prefer crossing on esker material. However, this may be an artifact of a sampling bias in the data.
- All recorded caribou crossings occurred between 5 minutes and 8.75 hours of a vehicle passing, with an average of 1.3 hours. The type of vehicle (heavy vehicle, light truck, or quad) had no apparent effect on the lag time to caribou crossing. Vehicle results should be treated with caution, as caribou may pass behind a camera or out of range of the camera motion detector, and therefore not all caribou crossings will be captured.

These results highlight the power of using motion-trigger cameras to draw connections between the many interacting variables that may explain caribou passage through the Project area. Overall the results

suggest that caribou are not affected by the structure of the road, but spatial differences in road crossing locations may be explained by sampling bias, traffic, timing, migratory route fidelity, or some combination of all of these. Additional data collection will help confirm any effects, particularly in the southern section of the road which was inaccessible in 2020 and 2021,

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ACRONYMS AND ABBREVIATIONS

Agnico Eagle	Agnico Eagle Mines Ltd.
ATV	All-terrain vehicle
AWAR	All weather access road
BQCMB	Beverly Qamanirjuaq Caribou Management Board
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
GN	Government of Nunavut
GNWT ENR	Government of Northwest Territories Department of Environment and Natural Resources
IOL	Inuit-owned land
IQ	Inuit Qaujimajatuqangit (Inuit Traditional Knowledge)
m	Metre
NIRB	Nunavut Impact Review Board
NWT	Northwest Territories
TEMMP	Meliadine Mine Terrestrial Environment Management and Monitoring Plan
The Project	The Meliadine Mine

1. PROJECT OVERVIEW

The Meliadine Mine (the Project), owned and operated by Agnico Eagle Mines Limited (Agnico Eagle), is located on Inuit Owned Land (IOL) approximately 25 km north of Rankin Inlet, Nunavut. A 34 km all weather access road (AWAR) connects the Project to Rankin Inlet. A bypass road was constructed to the west and south of Rankin Inlet to allow mine traffic to circumvent the hamlet when traveling from the AWAR to the Project marine laydown (Figure 1-1).

The Meliadine Mine was approved with a life of mine plan that includes production from five ore bodies by the Nunavut Impact Review Board (NIRB) in 2015 (Project Certificate #006). The mine plan includes open pits, underground mining and associated ore processing, waste management and ancillary infrastructure. Construction of the AWAR, camp, ore processing facilities and ancillary infrastructure began in 2017 and production from the Tiriganiaq deposit began in Q2 2019. The remainder of the orebodies are planned throughout the life of the Meliadine complex. In 2019, the Meliadine Mine NIRB Project Certificate (#006) was amended to include discharge of saline effluent to the marine environment via diffuser at Itivia Harbour and to convey via truck saline effluent along the AWAR to Itivia Harbour (i.e., Melvin Bay).

A caribou motion-trigger camera study was conducted in June and July 2020 and 2021 at the Meliadine Mine and AWAR in support of existing NIRB monitoring conditions as outlined in Project Certificate No.6.

1.1 Terrestrial Environment Management and Monitoring Plan

The Meliadine Mine 2015 Project Certificate and 2019 Project Certificate Amendment from the NIRB, Term and Condition 57 requires the Project to report in its annual NIRB report:

> "(T&C 57, c.) Demonstration and description of how the monitoring results, including the all-weather access road and associated access roads/trails contribute to cumulative effects of the project."

The Meliadine Mine Terrestrial Environment Management and Monitoring Plan (TEMMP; Agnico Eagle 2020) is designed to meet this condition, with a road surveillance monitoring program (Section 4.3) that has the following objective:

> "To record the presence of wildlife and/or wildlife signs (e.g., tracks, nesting) in relation to the Mine infrastructure. Of particular importance is the frequency of wildlife entering the Mine infrastructure areas and along the AWAR corridor. This information can then be used to determine any areas of attraction to wildlife, document human-wildlife conflicts, areas/timing of wildlife mortality or potential mortality; seasonal trends of wildlife occurrence in the Project area, and effectiveness of mitigation (e.g., waste management and landfill)."

The caribou camera program described in this report is designed to be complementary to the objective of the caribou collaring program (TEMMP Section 4.7), which is:

- To contribute to the scientific knowledge of caribou activity near mining operations and caribou population dynamics in Nunavut; and
- To assess whether caribou movement near the Project Area is hindered by Project infrastructure (i.e., mine site infrastructure and AWAR).

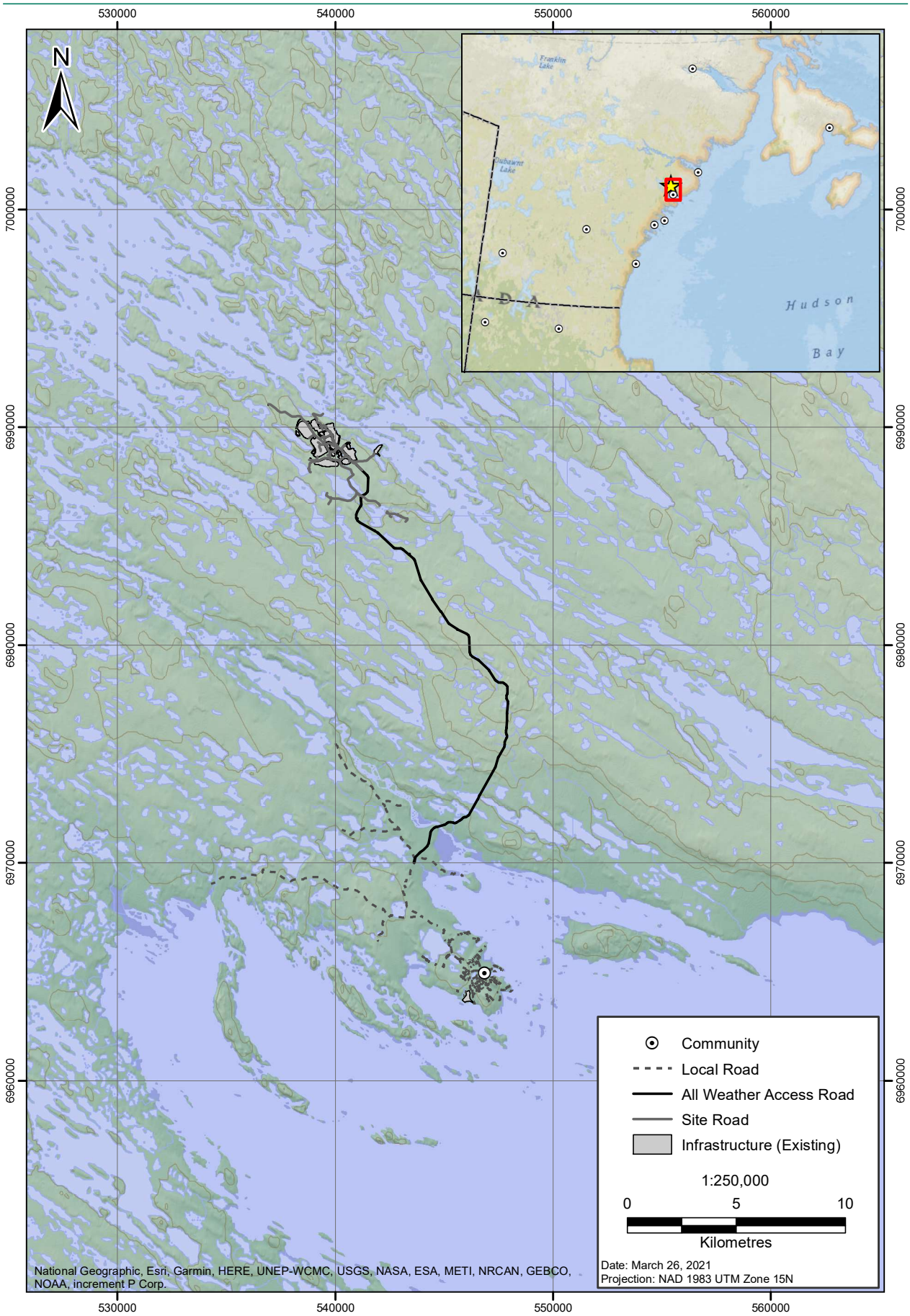


Figure 1-1: Meliadine Gold Project Location

2. STUDY OBJECTIVES

The objectives of the 2021 study were:

- To conduct a study using motion-trigger cameras at the Project site to estimate how the AWAR and site infrastructure contribute to cumulative effects of the project on caribou.
- To evaluate if there were specific locations with high numbers of caribou observations along the AWAR in 2021, and compare these locations with 2020 camera data, and with those identified by Inuit Qaujimajatuqangit (IQ) and collar data.
- To use the information on road crossings to determine what road features are preferred by caribou for crossing, specifically:
  - Material of road construction (esker vs. quarry);
  - Side slope;
  - Road height; and
  - Surrounding vegetation type.
- To evaluate what relationship (if any) there is between vehicles recorded on the road and location/timing of caribou observations.

3. BACKGROUND

3.1 Qamanirjuaq Herd

The Qamanirjuaq caribou herd is a large caribou herd numbering approximately over 200,000 animals in 2017, down from over 300,000 animals reported in 2008 (COSEWIC 2016). The herd range is centered in south-eastern Nunavut. The herd range stretches approximately 1,000 km from Chesterfield Inlet in the north to northern Manitoba in the south, and from Hudson Bay on the east to eastern Northwest Territories and north-eastern Saskatchewan in the west (BQCMB 2020a).

The Beverly and Qamanirjuaq Caribou Management Board (BQCMB) has rated the Qamanirjuaq herd as having Medium vulnerability in 2014 due to continued population declines since 2008 (BQCMB 2014) and upgraded this rating to Medium-High in 2016 (BQCMB 2016).

The herd generally winters below the treeline in northern Manitoba, Saskatchewan and the adjoining areas of Northwest Territories (NWT) and Nunavut. Spring migration is north along the coast of Hudson Bay, past the communities of Arviat, Whale Cove and Rankin Inlet to a broad calving ground generally centered on Qamanirjuaq Lake (BQCMB 2020a).

Following calving, the caribou form into large groups and radiate out from the calving grounds, including east towards the coast. During July, large groups of animals from this herd interact with the hamlet of Rankin Inlet, the Meliadine Mine and the AWAR connecting the two.

During summer and fall, the caribou generally move south and inland, gradually returning south towards their wintering areas by early December. Maps of the caribou range and movement are available on the BQCMB website (https://arctic-caribou.com/resources).

4. STUDY AREA

The dominant terrain in the Project area comprises glacial landforms such as drumlins (glacial till), eskers (gravel and sand), and lakes. A series of low relief ridges are composed of glacial deposits, oriented in a northwest-southeast direction, which control the regional surface drainage patterns. The property is approximately 60 metres (m) above sea level in low-lying topography with numerous lakes (Final Environmental Impact Statement; Agnico Eagle 2015).

The study area for the camera study included the existing Project footprint of the Meliadine Mine site and the AWAR.

5. METHODS

5.1 Camera Field Study

During 2020, AEM acquired Bushnell Core HD Low Glow motion-trigger cameras, which were installed along the AWAR and around the mine site. In 2021 the study was repeated with a focus on the AWAR and modifications to the survey design to better capture vehicle traffic. The cameras were programmed and installed in mid-June by a wildlife biologist from ERM and a Meliadine Environment technician, two weeks prior to the predicted arrival of caribou in the area. The ERM wildlife biologist maintained the cameras for the duration of the study and disassembled the cameras and setup in late July when the study ended.

Camera locations were selected to maximize coverage and representation of habitat and road types, and to best detect caribou and vehicles (Figure 5.1-1). The same locations were used in 2020 and 2021:

- Twenty-seven single cameras were installed at a spacing of 500 m to 1,000 m, starting from the gatehouse at KM 8 of the AWAR, and ending at the mine site at KM 30 of the AWAR. Cameras were not installed further south than the gatehouse due to COVID-19 protocols in place in 2020 and 2021.
- Through previous consultation and community meetings community members and Inuit Elders identified locations on the road where caribou are known to cross more frequently, including at KM 9, 12, 16, 22, and 27 (Public Meeting; Rankin Inlet, March 17, 2020). Cameras were placed at or near these locations.
- The camera locations were stratified by road structure, with approximately half of cameras placed in areas where the road shoulder was esker material and half where the shoulder was quarry rock. Locations were also selected to have equal representation of steep and flat road shoulders.
- All cameras were installed on the west side of the road facing north with the road in the camera field of view on the right side of images. In 2020, cameras were located up to 15 m from the road, whereas in 2021 cameras were place no more than 5 m from the side of the road in order to better capture vehicle traffic.

During camera setup, the surrounding habitat type, road structure, and GPS location were recorded. If any ATV trails or caribou trails were detected near the camera site, these were noted. The coordinates for the road cameras were used to calculate the distance to the mine and to Rankin Inlet along the AWAR.

Cameras were installed at a height of 50 centimetres, which was determined to be the optimal height for detecting movement of a passing caribou (ERM, unpublished data). Cameras on the AWAR were positioned to capture part of the road in the field of view. In 2020, cameras were not explicitly set up to capture vehicle traffic, but in 2021 cameras were placed closer to the road (no more than 5 m) to capture traffic. Four cameras spaced in quarters along the AWAR were set up facing the road to specifically capture vehicle passage. These cameras were analysed for vehicle traffic.

The installation setup was a simple bucket-and-stick design, where the camera was strapped onto a 2" × 4" piece of lumber that was stabilized in a bucket full of quarry rock (Photo 5.1-1). This setup was designed to be temporary and to minimize impact on the ground where it was placed. When the cameras were removed at the end of the study, all setup materials were returned to the Mine Site.

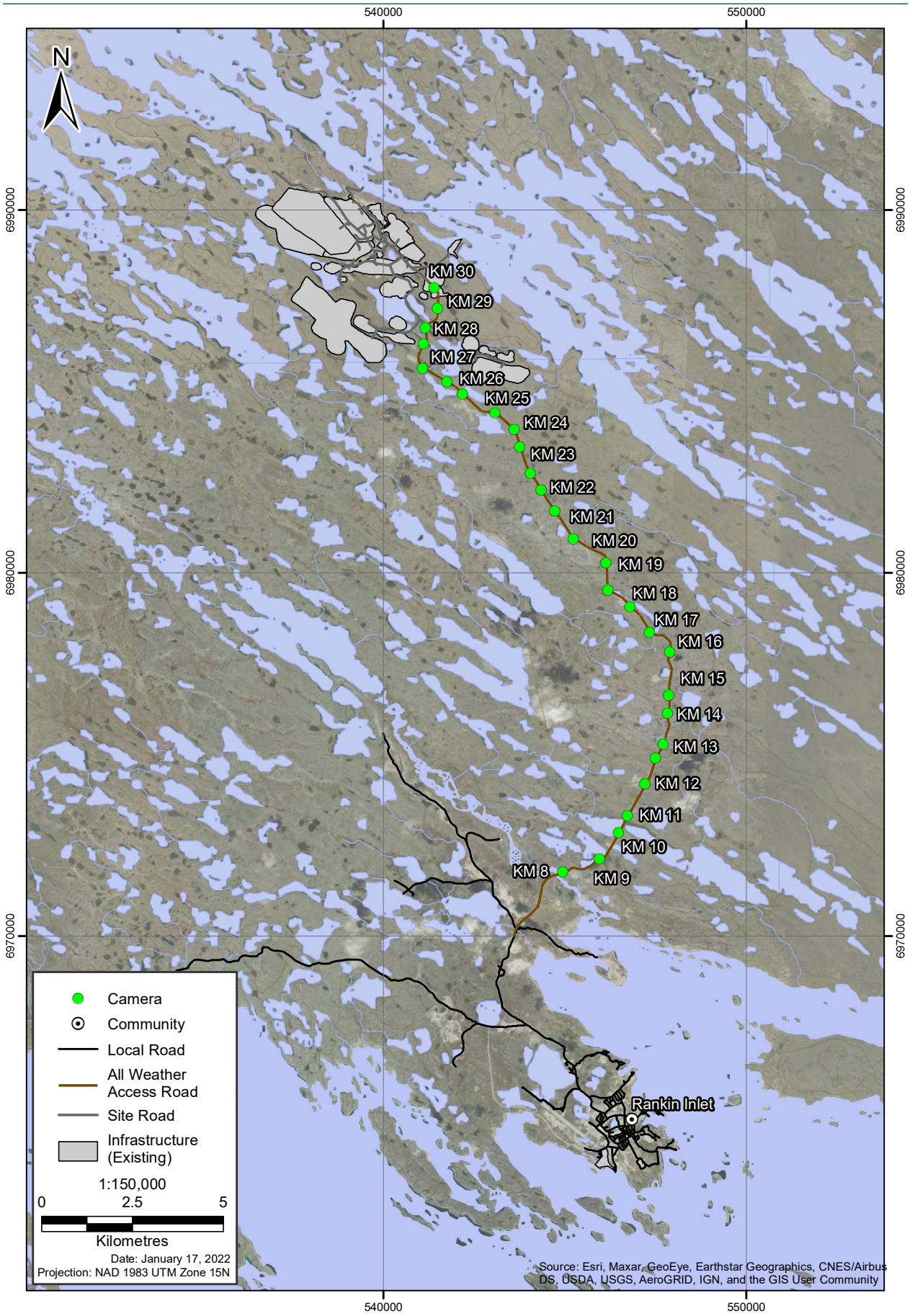


Figure 5.1-1: Locations of Motion-Trigger Cameras in July 2021

Photo 5.1-1: Typical camera setup from the Meliadine 2021 Study.

All cameras took pictures whenever motion was detected within 40 m of the motion detector, including wildlife, vehicles, and occasionally objects moving in the wind. In addition, all cameras were programmed to take one photo every thirty minutes, day or night. This was done for two reasons: 1) to help capture activity happening beyond the range of the motion detector, and 2) to provide assurance that the cameras were operational during the entire duration of the study (measure effort). The cameras were checked after one week to ensure battery life, SD card space, and positioning was still adequate. Throughout the duration of the study, field technicians and the ERM field biologist regularly checked the cameras to ensure they were still in place.

5.2 Road Structure Field Study

In 2020, additional surveys were conducted on the as-built AWAR to help address the objective of determining whether there are road characteristics that caribou prefer to cross on. The results of this survey were used in both the 2020 and the 2021 analysis.

An ERM wildlife biologist and Meliadine environment technician surveyed the road structure, taking the measurements every 100 m along the road, including:

- GPS location;
- Width of the road (m);
- Height of the road above the tundra (m);

- Road-side slope angle – measured with an inclinometer (east and west side);
- Road-side material (esker or quarry stone);
- Substrate grain size, i.e., the area of the roadside shoulder covered by <0.75 inch, 0.75 to 6 inch, 6 to 12 inch, and >12 inch stones (measurement standards used by road engineers); and
- Surrounding habitat features.

5.3 Photo Processing

ERM personnel reviewed all photos from the cameras and recorded every detection from wildlife. A detection is an event where an individual or group triggers the camera. There can be one photo or many photos in quick succession, depending on how long the caribou were in front of the camera. Hence, one detection may have many individual caribou.

Data recorded for each wildlife detection event included:

- The time of the first photo;
- The species of wildlife;
- The number of individuals in the group; and
- For events where multiple photos were captured, the duration of the motion-trigger event.

Vehicle traffic was also recorded on four cameras. Data recorded on each vehicle detection included:

- The time of the photo;
- The type of vehicle; and
- Whether the vehicle was travelling in a convoy or not.

5.4 Data Analysis

The analysis in this report was designed to quantify trends in the study data and determine whether factors such as road structure, vehicle traffic on the road, or placement of the cameras could be used to explain caribou occurrence and identify “hotspots” where caribou were likely to cross.

An initial exploratory analysis was conducted to visualize the data and determine the appropriate method for analyzing the data. Where data were complete, generalized linear models (GLMs) were used to assess the differences in the number of caribou detection events as a function of various controlling variables, including road structure and the occurrence of vehicle traffic. This regression framework provides a means to control for habitat, environmental variables, repeated measurements, and spatial correlation. For some comparisons in which statistical models were not useful due to a small sample size, summary statistics and correlations were calculated. This included the comparison of collar data to camera data by kilometre of roadway. Analyses were carried out using program R version 3.6.3 (R Core Team 2017).

6. RESULTS AND DISCUSSION

6.1 Field Work

In total, 27 cameras were deployed on June 23 and 24, 2021, and were removed on July 13, 2021. This amounted to more than 540 trap-nights and ~100,000 photos. More than two-thirds of all photos were from timed photos, most of which did not contain wildlife or vehicles. The remainder were from motion-triggered events. Of the 27 cameras deployed, one was unsuccessful due to a programming malfunction.

The study concluded on July 12, 2020, when caribou had not been observed for several days at or near the Project and collar data indicated that they were not expected to return. Cameras were removed and the setup was disassembled. It should be noted that several large groups of caribou were observed crossing the southern portion of the road near Rankin Inlet after July 12, after the cameras had been removed. Collar data indicated that there were likely two to three days of data that were not captured by the cameras as a result of this, but that the majority of the migration had been captured.

6.2 Caribou Distribution Relative to the AWAR

One of the objectives of this study was to evaluate if there were specific locations with high numbers of caribou observations along the AWAR in 2021, and compare these locations with those identified in 2020 and with collar data and IQ.

Of the 358 independent wildlife detection events from the cameras in 2021, more than a third were from caribou (Table 6.2-1). The first observations of caribou occurred on June 27, 2021, which was consistent with the collar data and observations of caribou from site personnel who were conducting wildlife surveys. Caribou detections peaked from June 29 to July 2, with 38 detection events and 1,654 adult caribou recorded across all cameras on July 1 (Figure 6.2-1). This was approximately one week earlier than peak caribou detections in 2020, which occurred from July 4 to 9, 2020 (Figure 6.2-1). This finding is consistent with patterns of inter-annual variability observed in the collar data.

Table 6.2-1: Wildlife Detections across All Cameras

Wildlife Type	Number of Camera Detections in 2020	Number of Camera Detections in 2021
Arctic Fox	13	14
Arctic Ground Squirrel	3	8
Arctic Hare	4	4
Caribou	91	128
Gull	12	11
Raptor	1	2
Sandhill Crane	6	28
Songbird	23	17
Uncategorized Bird	35	110
Unknown	1	0
Waterfowl	51	30
Uncategorized Mammal	0	6
Total	**240**	**358**

Note: Detections may be from motion-triggered photos or from timed photos. For consistency, results from off-site cameras in 2020 were not included in these results.

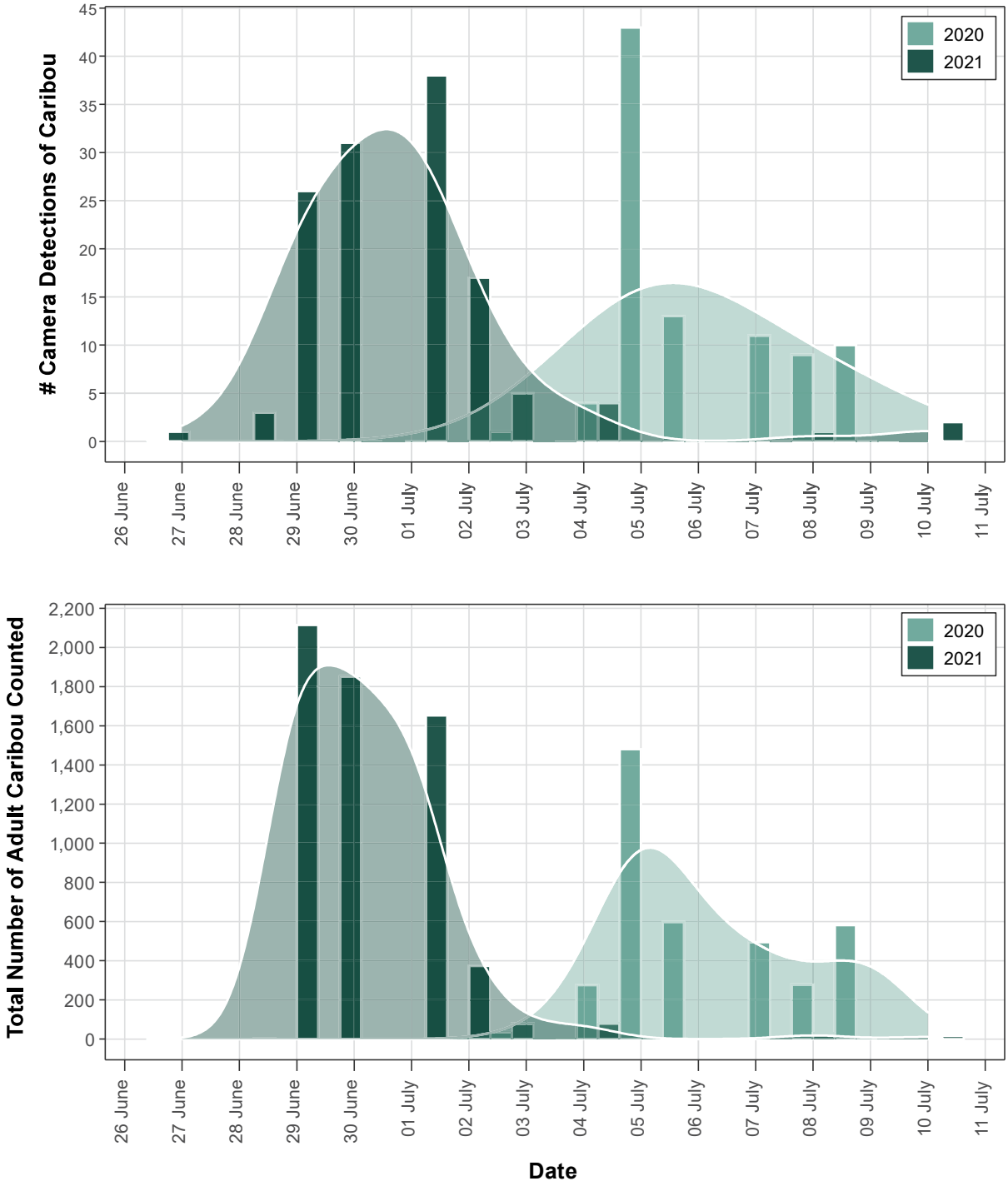


Figure 6.2-1: Caribou Detections across All Cameras by Date

After the peak, caribou were detected less frequently and smaller groups every day until July 12, when most of the cameras were demobilized. Caribou were detected in 25 of 27 cameras (93%) in 2021, compared to 73% of road cameras in 2020. More caribou were detected overall in 2021. Most caribou observations were concentrated in the northern half of the AWAR (Figure 6.2-2), but as noted in Section 6.1, caribou may have been near the southern half of the AWAR after July 12.

Time of day was not related to the number of caribou detections, although there was some evidence that caribou were detected more consistently during the day (09:00 to 21:00) than at night in 2021 (Figure 6.2-2). The same trend was not noted in 2020.

Overall, the results suggest that the span from KM 22-24 was a major crossing area in 2021, with 27% of all crossings recorded at KM 22 (Figure 6.2.3). The major caribou crossing locations identified by Elders and community members in March 2020 are at KM 16, 22, and 27. The results from the 2021 cameras are consistent with these crossing locations.

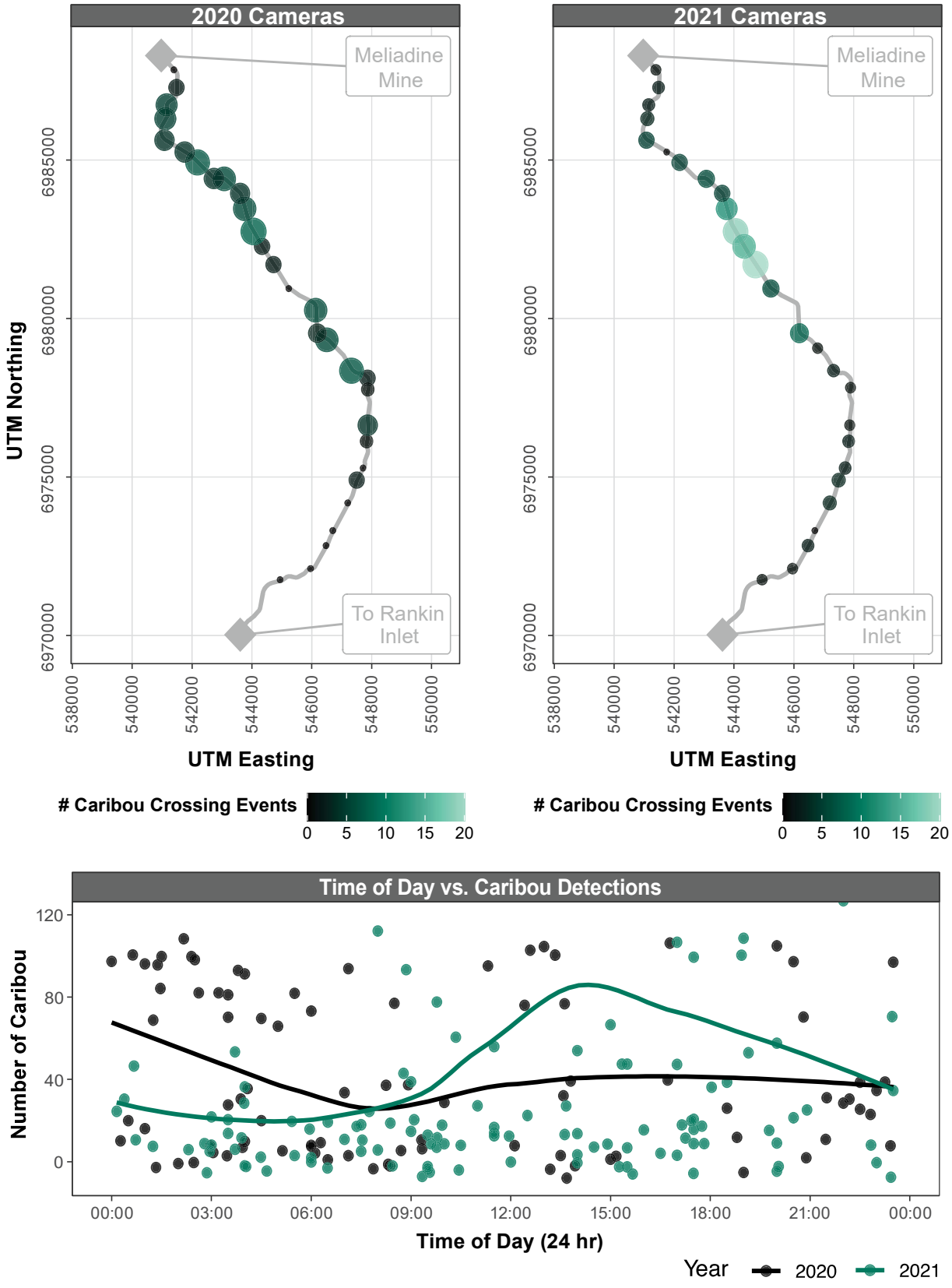
A comparison between the camera data from 2020 and 2021 and collar data from previous years (2012-2019) is shown in Figure 6.2-3, where values for each kilometre segment of the road are expressed as the proportion of total crossing events that occurred in that segment. This comparison was done to identify potential hotspots for caribou crossing and test whether there is any consistency across years and between data types. The extent of agreement between the hotspots identified in the two datasets can be measured by testing the correlation: an index of linear relationship between variables. A correlation value of 100% would indicate that the number of crossings per km in the camera data are identical to the number of crossings per km in the collar data. A correlation value of 0% indicates there is no similarity between the locations identified in the two datasets.

The camera data from 2021 shares a 40% similarity with the camera data from 2020, with both datasets showing relatively high numbers of crossings between KM 22 and 24 (an IQ identified section) and few crossings in the southern portion of the road. In 2021 fewer crossings occurred near KM 27 and KM 16, two locations identified by Elders that were more heavily frequented in 2020 (Figure 6.2-3).

The collar data collected by the GN over 2012-2019 is most similar to the camera data from 2020. Both the collar data and camera data suggest that caribou have preferred crossing locations that are generally consistent (within ~1 km). Removing the southernmost 7 km of the AWAR from the analysis increases the correlation between the camera data and the collar data from 12% to 63%, which aligns with the notion that the camera data from the southernmost section of the AWAR were incomplete in both 2020 and 2021 due to the cameras being removed before caribou completely left the area.

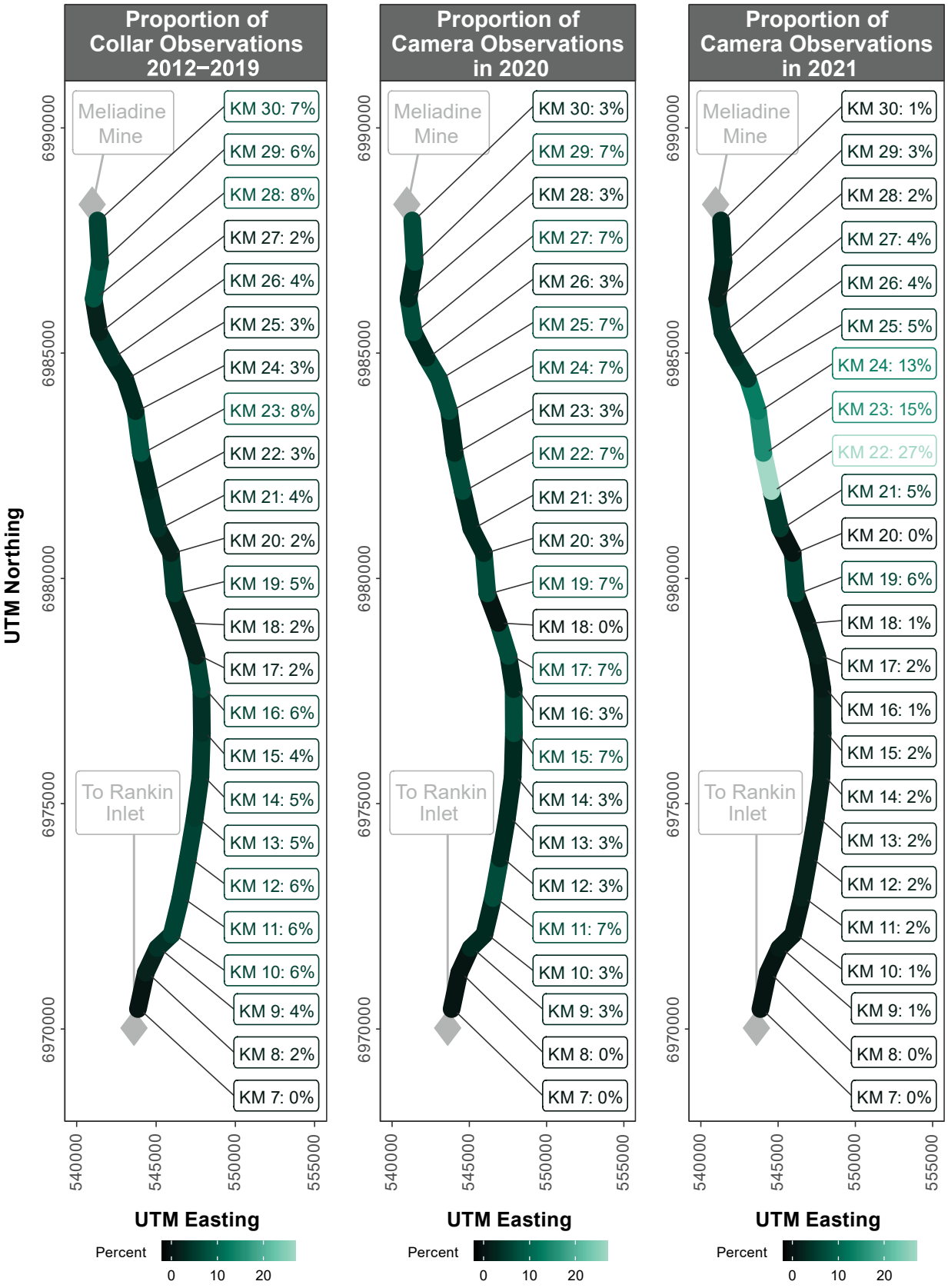
Overall, the hotspots identified by the camera data in both 2020 and 2021 aligned more closely with the IQ identified hotspots than the collar data from 2012-2019. This makes sense as only a small fraction of caribou are collared, and therefore crossing locations identified from collar data are far more subject to random chance. Some inter-annual variation is expected and may also help explain the differences noted between IQ, camera data, and collar data.

The results from two years of camera studies suggest that cameras are a far more effective way of capturing road crossings than collar data, as the average number of road crossing events in the collar data was only 20 individuals per year, with a maximum of 62 individuals crossing 2018. Assuming that the number of caribou interacting with the AWAR is relatively stable year to year, then the 91 and 128 caribou detection events captured on the AWAR cameras in 2020 and 2021 (respectively) represent a more than 540% increase from the average collar rate. This is important as it suggests that preferred crossing locations may be only partially detected by collar data. A systematic camera study has the critical advantage that it not only detects where caribou *are*, but also where they *are not.* This, in combination with the fact that camera placement can be controlled for road characteristics, makes it possible to test for the association between caribou detections and road characteristics. This is simply not possible with collar data. In addition, the hotspots identified by the camera data aligned more closely with the IQ identified hotspots than the collar data.



Note: Both colour and size of icon indicate the number of caribou at that location.

Figure 6.2-2: Distribution of Caribou Detections on Cameras and Time of Day of Detections



Note: "proportion" indicates the proportion of caribou detections in each 1 km segment out of the total count of detections on the AWAR for that dataset. Crossing locations identified by Inuit Qaujimajatuqangit (IQ) are at KM 9, 12, 16, 22, and 27.

Figure 6.2-3: Comparison of Road Crossing Locations from Cameras (2020 & 2021) and From Collar Data (2012-2019)

6.3 Road Structure Survey Results and Caribou

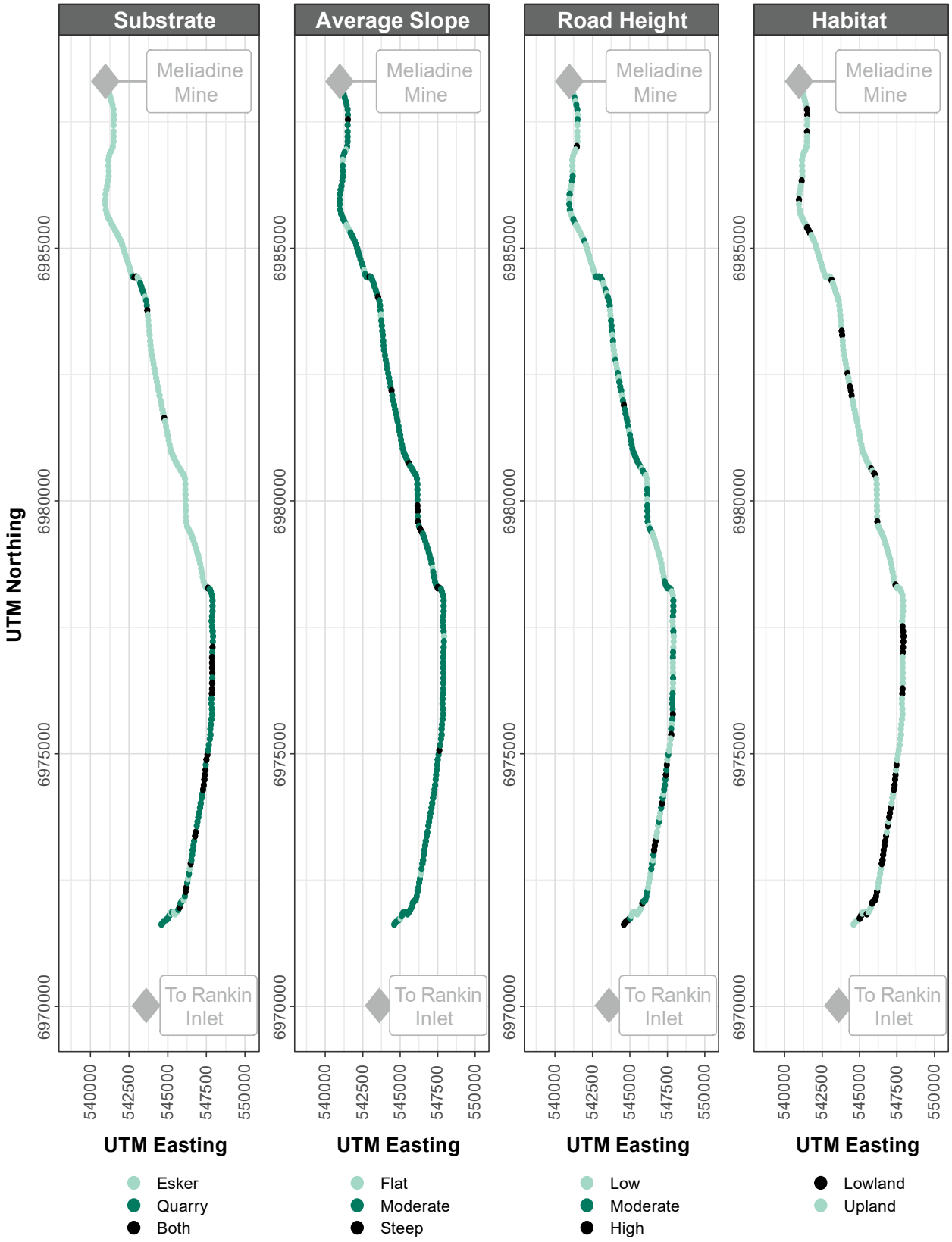
The next objective for this study was to use the information on the number of road crossings at each camera to determine if caribou prefer particular road conditions for crossing, specifically: material of road construction (esker vs. quarry); side slope; road height; and surrounding vegetation type.

In 2020, road surveys for structure and substrate type were completed every 100 m along the length of the AWAR from KM 8 (at the gatehouse) to the mine entrance at KM 30, totalling 210 surveys. The results of these surveys are presented in Figure 6.3-1. Road structure was generally consistent, with 88% of the roadside slope measurements falling within the “moderate” category (3.7:1 to 1.7:1 or 15-30 degrees), and only 6% classified as steep (<1.7:1 or 30 degrees). Similarly, 92% of road height measurements were either low (<1 m from the tundra; 48%), or moderate (between 1-2 m from the tundra; 44%). The maximum road height measured was 4.9 m, but this value represented an outlier as it was measured on a bridge ramp.

The surveys indicated there was a higher proportion of road with esker as the substrate material in the northern two-thirds of the AWAR, and a higher proportion of quarry rock as the substrate material in the southern third of the AWAR (Figure 6.3-1). This was likely because there is a large esker at approximately KM 18 that was used to construct the majority of the northern part of the road. There was also a higher proportion of lowland habitat in the southern third of the AWAR.

The road structure at the site of each camera was compared with the number of caribou detected in 2021 (Figure 6.3-2). Neither slope nor road height was correlated with the number of caribou detected crossing the road, as evidenced by the flat GLM line fitted to the data. This may be due to the lack of variability in road height and slope along the length of the AWAR – the majority of the road had moderate side slope and low height. These results are consistent with the results of the 2020 camera study.

Caribou did appear to cross the road more readily where esker material was the substrate vs. quarry rock, but quarry rock was concentrated in the southern portion of the road where the cameras were removed first. This suggests that the apparent preference by caribou of esker over quarry rock may be an artifact of the data, and not a true effect. When only the northern two-thirds of the roadway was included in the analysis, no difference was found between esker and quarry rock and caribou detections. The presence of a higher proportion of lowland habitat in the southern portion of the AWAR, which includes marshes and lakes, may have also reduced the number of locations where caribou are likely to cross. The same trend was noted in 2020, when the camera survey also incomplete in the southern section of the road.



Note: Flat slope is < 15 degrees or 3.7:1; moderate slope is 15-30 degrees or 3.7:1 - 1.7:1; and steep slope is >30 degrees or 1.7:1
Low height is < 1 meter; moderate height is 1-2 meters; and high height is >2 meters

Figure 6.3-1: Road Structure Survey Results

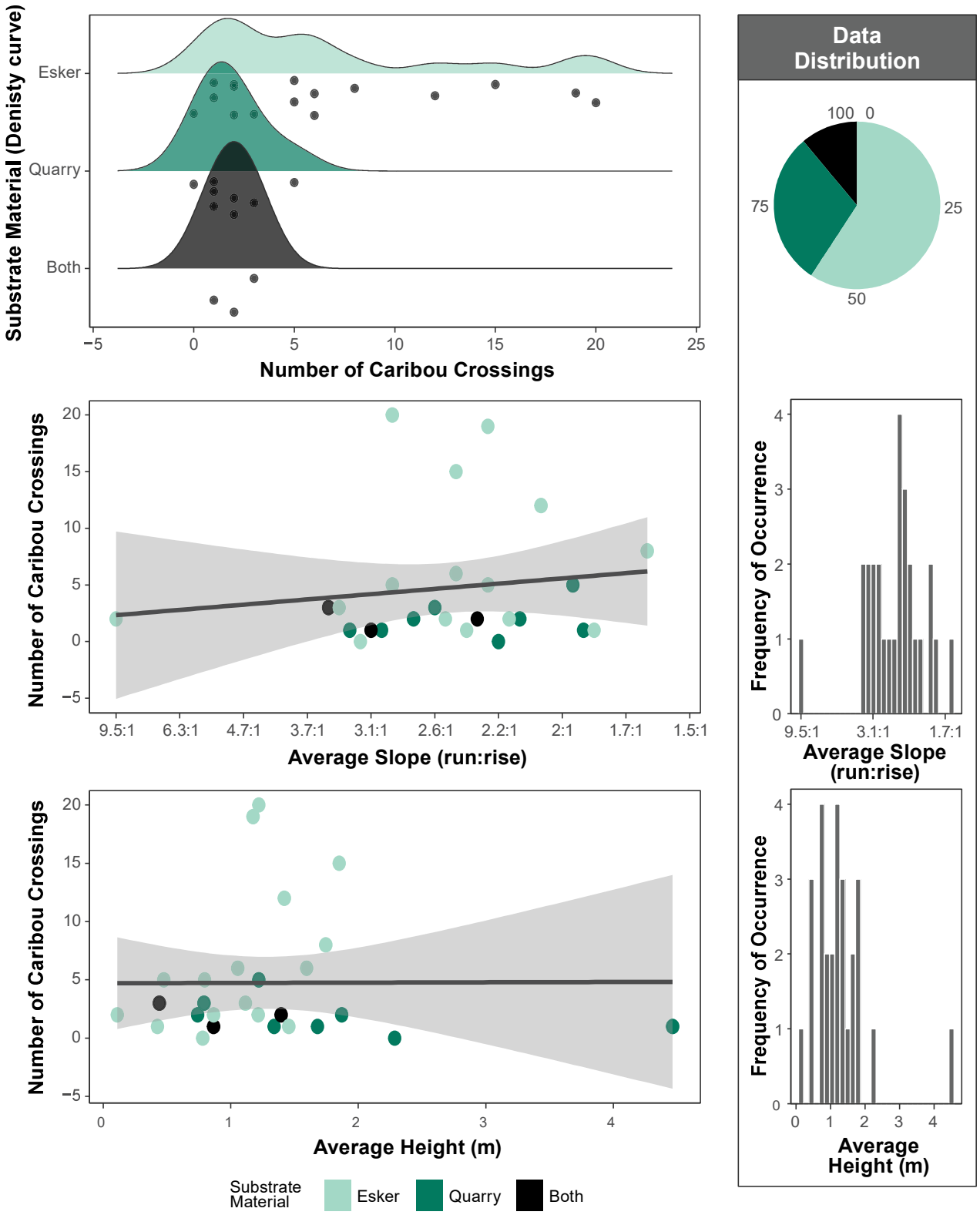


Figure 6.3-2: Comparisons of Road Structure and Caribou Detections

6.4 Vehicle Detections on the AWAR and Caribou

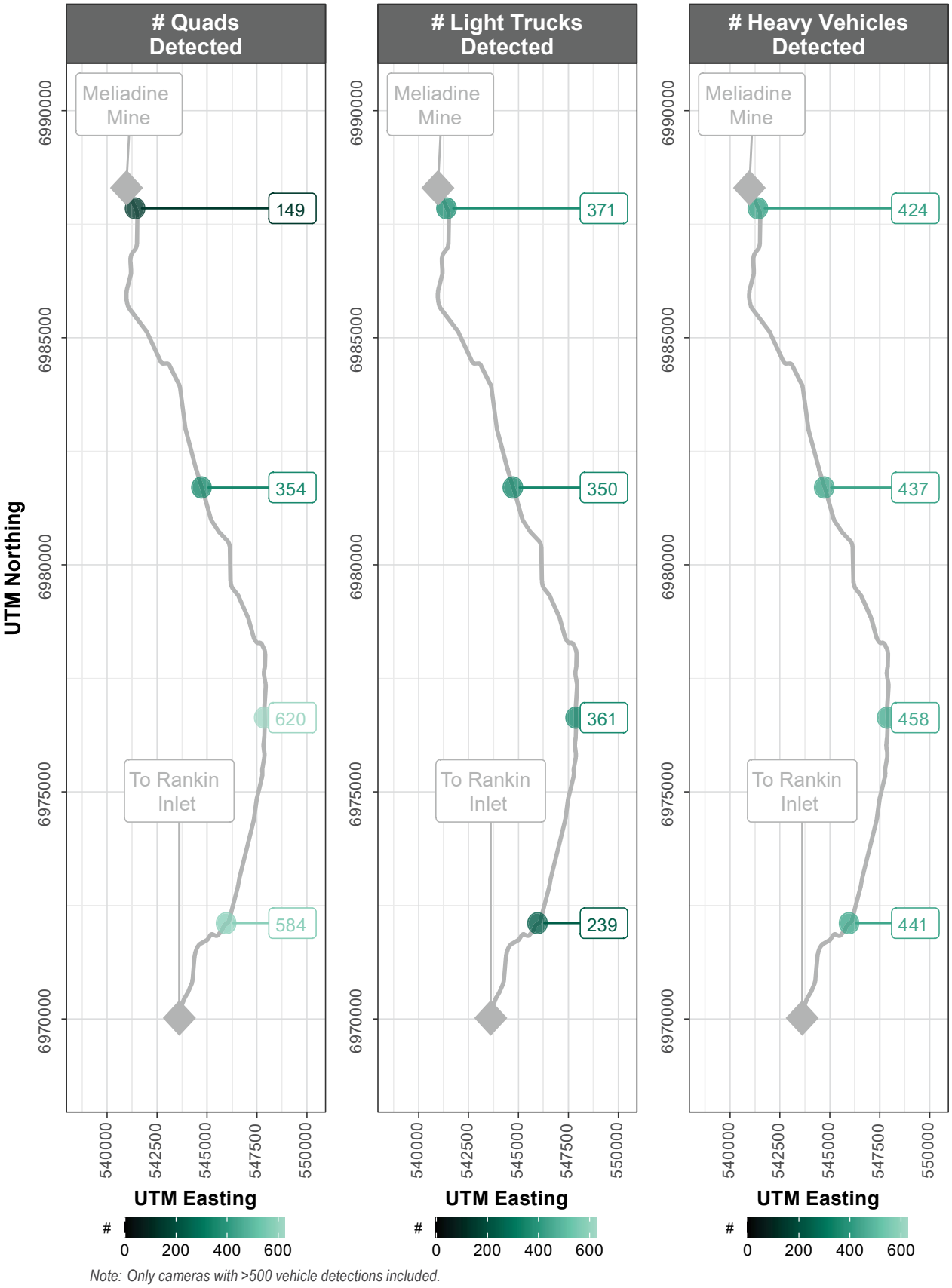
In 2021, the cameras were angled to better capture vehicle traffic on the road, based on lessons learned in 2020 when vehicle traffic was only captured incidentally. Because each camera had hundreds of vehicle triggers, it was decided that only four cameras would be processed for vehicle traffic, one for each quarter section of the AWAR. A summary of vehicles detected on those four cameras is presented in Table 6.4-1. The number of vehicles detected in each of these cameras was consistent (Figure 6.4-1), particularly for heavy vehicles, which are more likely to travel the entire length of the AWAR than light trucks and quads.

Table 6.4-1: Vehicle Detections across the Four Cameras Processed

Vehicle Type	Vehicle	Average Number of Detections Across Cameras	Proportion of Total Detections (%)
Heavy Vehicle	Ambulance	6	0.33
	Box Truck	63	3.24
	Cement Truck	2	0.08
	Flatbed Truck	62	3.23
	Forklift	2	0.1
	Front Loader	2	0.08
	Fuel Tanker	74	3.8
	Grader	21	1.1
	Haul Truck	7	0.38
	School Bus	177	9.15
	Tractor Trailer	268	13.86
	Water Truck	36	1.86
Light Truck	Pickup Truck	525	27.13
	Service Truck	5	0.28
Quad	Motorcycle	5	0.24
	Quad	680	35.13
Total		**4788**	**100**

The three primary groups of vehicles (quads, pickups and heavy vehicles) exhibited slightly different patterns of observations:

- There were notably more quads in the southern section of the road compared to the northern section. This is consistent with a scenario of people traveling out from Rankin Inlet and either stopping along the road, or turning off to side trails and cabins along the road.
- Pickup trucks are relatively consistent between the three northern cameras, but fewer were detected at the southern camera. This is consistent with a scenario where most pickup trucks are based at the mine site, with some stopping along the road to conduct surveys or road checks.
- The number of heavy trucks was consistent across all four cameras, with only small differences which may be attributable to error in detection by cameras. This is consistent with heavy trucks primarily hauling fuel and equipment from Rankin Inlet to the mine site and not stopping along the road.



Note: Only cameras with >500 vehicle detections included.

Figure 6.4-1: Number of vehicle detections on the AWAR by vehicle type

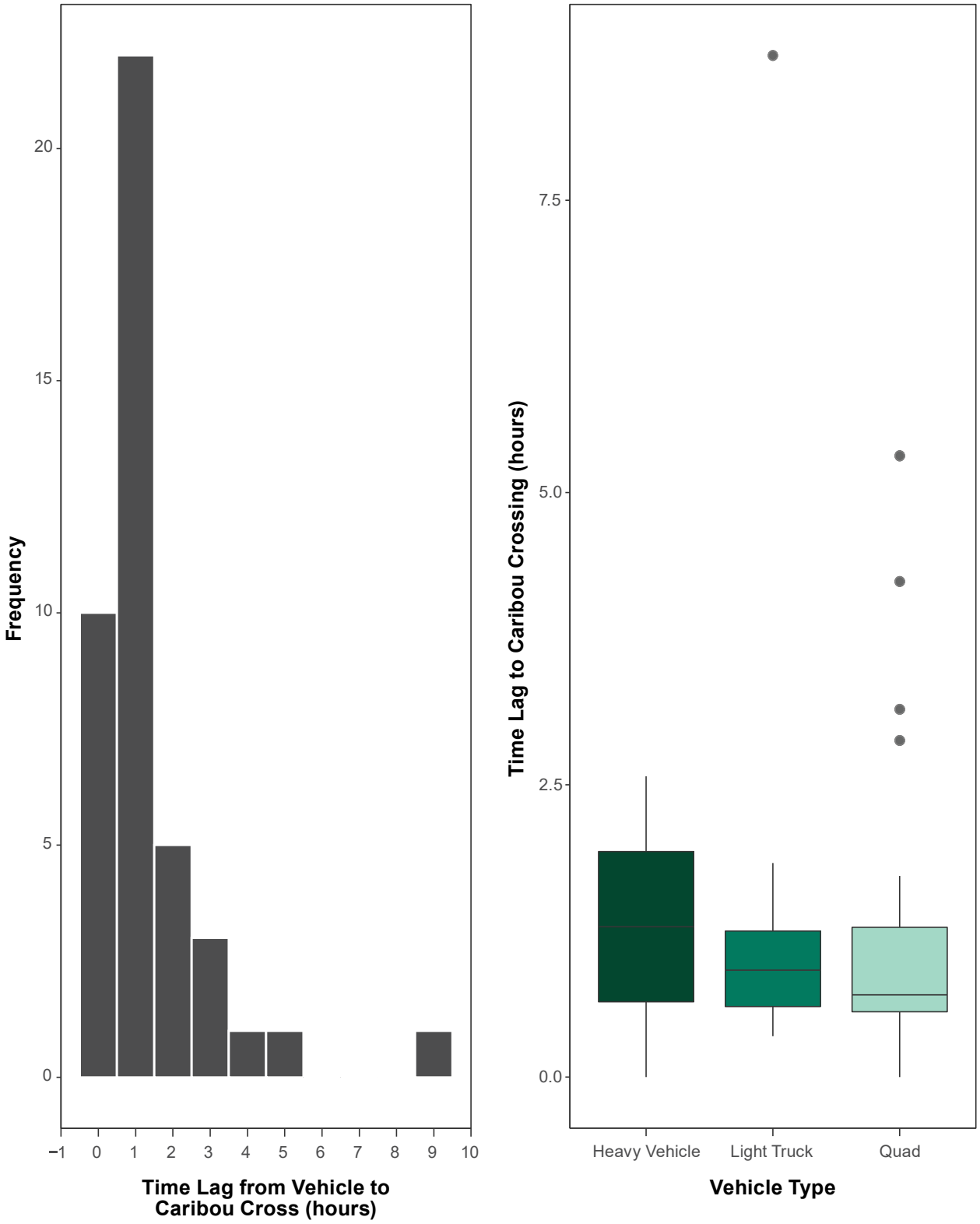
For the four “vehicle cameras” processed, the time between a vehicle passing and caribou crossing – or lag time – was calculated. Caribou crossings from any camera within 1 km of the vehicle camera were included, under the assumption that vehicles detected on a vehicle camera would be detected on nearby cameras within plus or minus five minutes and therefore caribou would detect those vehicles at a similar time at nearby cameras. It was also assumed that if caribou were photographed within 5 m of the road, where the camera was placed, then they crossed the road.

There were 43 instances where caribou crossed the road after a vehicle was detected. The mean lag time to crossing was 1 hours 18 minutes, and the median lag time was 50 minutes (Figure 6.4-2). The maximum lag time was 8 hours 45 minutes, occurring after a passing pickup truck. A breakdown by vehicle type suggests that the type of vehicle (heavy vehicle, light truck, or quad) did not have an effect on the lag time to caribou crossing, with the highest mean lag time (1 hour 26 minutes for light trucks) being only 14 minutes different from the lowest mean lag time (1 hour 12 minutes for quads).

During the peak caribou movement period, much of the Project vehicle traffic on the AWAR occurred within convoys of three or more vehicles, usually with several heavy vehicles flanked on each side by a pick-up truck. Only one instance was captured of caribou crossing the road following a convoy. In that instance, the lag time to cross the road was 2 hours and 34 minutes. The relative lack of data points following convoys can most likely be attributed to the fact that during the peak caribou movement period, traffic was substantially reduced.

These vehicle results should be treated with caution, as caribou may pass behind a camera or out of range of the camera motion detector, and therefore not all caribou crossings will be captured. As we are reasonably certain that most or all passing vehicles were captured on camera, these estimates of lag time are likely over-estimates, but provide a conservative place to start assessing the behavioural impact of passing vehicles.

The important take-away from this analysis is that the time between a vehicle passing and caribou crossing the road is on the order of minutes to a few hours, not many hours or days. This suggests that caribou, during June and July, on this road and with the type of traffic observed, are willing to cross the road during relatively short pauses in traffic.



Note: The midpoint represented on the boxplot is the median value, not the mean.

Figure 6.4-2: Lag time from Vehicle Detection to Caribou Detection

7. SUMMARY

The results of this study suggest the potential for many interacting factors explaining where and when caribou cross the AWAR. The choice of where to cross the road may be mitigated by several factors to varying degrees, including habitat, road traffic, substrate type, and inter-annual route fidelity (i.e., same route chosen every year).

Overall, the camera study found that the cameras were successful at capturing many caribou crossing the AWAR.

One of the objectives of this study was to evaluate if there were specific locations with high numbers of caribou observations along the AWAR in 2021, and compare these locations with those identified in 2020 and by collar data and IQ.

- Peak caribou passage occurred one week earlier in 2021 vs 2020, consistent with patterns of inter-annual variability observed in the collar data.
- The study found that caribou crossing timing and locations on the AWAR in 2021 were consistent with locations identified in 2020 and with locations identified by IQ from Elders and community members. The hotspots identified by the camera data in both 2020 and 2021 aligned more closely with the IQ identified hotspots than the collar data from 2012-2019.
- Cameras have the potential to capture far more caribou crossings on the AWAR than collars alone. A systematic camera study also has the critical advantage over collar data that it not only detects where caribou *are*, but also where they *are not.* This, in combination with the fact that camera placement can be controlled for road characteristics, is what make it possible to test for the association between caribou detections and road characteristics.

The next objective for this study was to use the information on road crossings determine whether caribou prefer to cross the road at locations with a particular set of road features, specifically: material of road construction (esker vs. quarry); side slope; road height; and surrounding vegetation type.

- Road height and road-side slope did not have an impact on caribou crossing locations.
- Alternatively, since the structure of the road is relatively uniform along its length, there may not be enough difference in the shape, profile, or materials used to build the road to influence which sections of the road caribou prefer to cross, or crossing locations may be driven by surrounding features, such as habitat, trails, etc.
- Caribou appeared to cross the AWAR more readily in the northern portion of the road where esker rock is more common as a substrate, but this may be an artifact of a sampling bias in the data.

The last objective for this study was to evaluate what relationship (if any) there is between vehicles recorded on the road and the location and timing of caribou observations.

- All recorded caribou crossings occurred between 5 minutes and 8.75 hours of a vehicle passing, with the average lag time between vehicles passing and caribou crossing at 1 hour and 18 minutes.
- A breakdown by vehicle type suggests that the type of vehicle (heavy vehicle, light truck, or quad) did not have an effect on the lag time to caribou crossing.

Insights about improving data collection in the future include leaving cameras out longer, replacing cameras with programming errors, and setting cameras in the southern section of the road as restrictions allow. This study highlights the power of using motion-trigger cameras to draw connections between the many possible variables explaining caribou movement. The results suggest that multiple factors may contribute to when and where caribou cross the AWAR, including vehicle traffic, road substrate, and inter-annual variability.

8. REFERENCES

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APPENDIX A DATA FROM MOTION-TRIGGER CAMERAS

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
1	6/29/2021	06:00:00	06:00:00	T	6290569	6290569	1	Arctic Fox	1	0	Walking	SE	N
	6/29/2021	11:10:33	11:10:33	M	6290583	6290583	1	Songbird	1	0	Standing	W	N
	7/1/2021	20:00:00	20:00:00	T	7010825	7010825	1	Gull	1	0	Flying	W	N
	7/6/2021	17:00:00	17:00:00	T	7060508	7060508	1	Uncategorized Bird	NA	NA	Flying	E	N
2	6/23/2021	21:30:00	21:30:00	T	6230081	6230081	1	Uncategorized Bird	2	0	Flying	NA	N
	6/25/2021	16:00:00	16:00:00	T	6250198	6250198	1	Gull	1	0	Flying	W	Y
	6/28/2021	09:52:29	09:52:29	M	6280486	6280486	1	Sandhill Crane	1	0	Standing	W	N
	6/30/2021	07:30:00	07:30:00	T	6300695	6300695	1	Waterfowl	2	0	Feeding	E	N
	6/30/2021	10:30:00	10:30:00	T	6300707	6300707	1	Uncategorized Bird	1	0	Flying	W	N
	6/30/2021	11:16:42	11:16:42	M	6300709	6300709	1	Uncategorized Bird	1	0	Flying	W	N
	6/30/2021	12:44:51	12:44:51	M	6300718	6300718	1	Uncategorized Bird	2	0	Flying	E	N
	6/30/2021	14:05:26	14:05:26	M	6300723	6300723	1	Uncategorized Bird	1	0	Flying	E	N
	7/1/2021	14:32:32	14:32:43	M	7010805	7010806	2	Uncategorized Bird	1	0	Flying	W	N
	7/1/2021	19:00:00	19:02:47	T	7010830	7010831	2	Caribou	100	unknown	Grazing	E	N
	7/2/2021	15:52:59	15:52:59	M	7020929	7020929	1	Uncategorized Bird	1	0	Flying	NA	N
	7/3/2021	11:28:30	11:28:35	M	7030005	7030006	2	Uncategorized Bird	1	0	Flying	NA	N
	7/3/2021	12:11:10	12:11:10	M	7030010	7030010	1	Uncategorized Bird	7	0	Flying	W	N
	7/3/2021	12:27:10	12:27:10	M	7030012	7030012	1	Uncategorized Bird	1	0	Flying	NA	N
	7/3/2021	13:37:25	13:37:25	M	7030020	7030020	1	Uncategorized Bird	1	0	Flying	NA	N
	7/3/2021	17:15:14	17:36:45	M	7030059	7030061	3	Uncategorized Bird	3	0	Flying	E	N
	7/3/2021	17:47:06	17:49:24	M	7030063	7030064	2	Uncategorized Bird	2	unknown	Flying	NA	N
	7/3/2021	18:30:00	18:30:00	T	7030066	7030066	1	Uncategorized Bird	2	unknown	Flying	NA	N
	7/3/2021	19:30:00	19:30:00	T	7030070	7030070	1	Uncategorized Bird	4	0	Flying	NA	N
	7/4/2021	14:00:39	14:00:39	M	7040164	7040164	1	Uncategorized Bird	2	0	Flying	NA	N
	7/4/2021	15:17:09	15:17:09	M	7040179	7040179	1	Uncategorized Bird	1	0	Flying	NA	N
	7/5/2021	20:33:24	20:33:24	M	7050379	7050379	1	Uncategorized Bird	1	0	Flying	W	N
	7/6/2021	05:30:00	05:30:00	T	7060404	7060404	1	Uncategorized Bird	1	0	Flying	NA	N
	7/6/2021	07:30:00	07:30:00	T	7060409	7060409	1	Uncategorized Bird	11	0	Flying	W	N
	7/6/2021	15:26:20	15:26:26	M	7060482	7060483	2	Uncategorized Bird	1	0	Flying	E	N
	7/6/2021	15:26:31	15:26:36	M	7060484	7060485	2	Uncategorized Bird	1	0	Flying	E	N
	7/6/2021	16:16:03	16:16:03	M	7060494	7060494	1	Uncategorized Bird	1	0	Flying	E	N
	7/6/2021	22:30:00	22:30:00	T	7060533	7060533	1	Uncategorized Bird	1	0	Flying	E	N
	7/7/2021	07:58:14	07:58:14	M	7070556	7070556	1	Uncategorized Bird	1	0	Flying	W	N
	7/7/2021	07:58:37	07:58:37	M	7070558	7070558	1	Uncategorized Bird	1	0	Flying	W	N
	7/7/2021	10:00:00	10:00:00	T	7070577	7070577	1	Uncategorized Bird	1	0	Flying	N	N
	7/8/2021	09:22:41	09:22:41	M	7080711	7080711	1	Uncategorized Bird	1	0	Flying	W	N
	7/8/2021	15:41:31	15:41:38	M	7080772	7080773	2	Raptor	1	0	Flying	W-E	N

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
2	7/8/2021	18:41:53	18:41:53	M	7080795	7080795	1	Uncategorized Bird	2	0	Flying	N	N
(cont'd)	7/9/2021	08:26:58	08:26:58	M	7090863	7090863	1	Uncategorized Bird	4	0	Flying	W	N
	7/9/2021	08:27:23	08:27:23	M	7090868	7090868	1	Uncategorized Bird	1	0	Flying	W	N
	7/9/2021	13:24:36	13:24:36	M	7090909	7090909	1	Uncategorized Bird	1	0	Flying	W	N
	7/9/2021	18:01:16	18:01:16	M	7090984	7090984	1	Uncategorized Bird	1	0	Flying	E	N
	7/10/2021	06:30:00	06:59:37	T	7100025	7100027	3	Uncategorized Bird	1	0	Flying	E	N
	7/10/2021	08:34:51	08:34:51	M	7100036	7100036	1	Uncategorized Bird	1	0	Flying	E	N
	7/10/2021	08:43:34	08:43:34	M	7100039	7100039	1	Uncategorized Bird	1	0	Flying	E	N
	7/10/2021	14:42:12	14:42:42	M	7100080	7100080	1	Uncategorized Bird	1	0	Flying	W	N
	7/10/2021	17:30:00	17:30:00	T	7100116	7100116	1	Uncategorized Bird	2	0	Flying	E	N
	7/10/2021	17:38:23	17:38:23	M	7100117	7100117	1	Uncategorized Bird	1	0	Flying	W	N
	7/10/2021	17:49:20	17:49:20	M	7100119	7100119	1	Uncategorized Bird	1	0	Flying	E	N
	7/10/2021	17:55:49	17:55:49	M	7100121	7100121	1	Uncategorized Bird	1	0	Flying	E	N
	7/10/2021	18:03:10	18:03:10	M	7100125	7100125	1	Uncategorized Bird	1	0	Flying	E	N
	7/11/2021	13:57:13	13:57:13	M	7110232	7110232	1	Uncategorized Bird	1	0	Standing	NA	N
	7/12/2021	07:00:00	07:00:00	T	7120312	7120312	1	Uncategorized Bird	1	0	Flying	E	N
	7/12/2021	10:04:34	10:04:34	M	7120330	7120330	1	Uncategorized Bird	3	0	Flying	E	N
	7/12/2021	12:12:10	12:12:10	M	7120337	7120337	1	Uncategorized Bird	1	0	Flying	E	N
	7/12/2021	22:32:47	22:32:47	M	7120380	7120380	1	Uncategorized Bird	1	0	Flying	E	N
3	6/24/2021	06:58:34	06:58:34	M	6240104	6240104	1	Waterfowl	2	0	Flying and Running	W	N
	6/24/2021	19:00:00	19:00:00	T	6240180	6240180	1	Uncategorized Bird	1	0	Flying	E	N
	6/25/2021	04:00:00	04:00:00	T	6250202	6250202	1	Uncategorized Bird	2	0	Feeding	E	N
	6/25/2021	05:46:32	05:46:32	M	6250206	6250206	1	Uncategorized Bird	1	0	Flying	E	N
	6/25/2021	07:59:23	07:59:30	M	6250213	6250214	2	Uncategorized Bird	1	0	Flying	W	N
	6/26/2021	09:15:17	09:15:17	M	6260302	6260302	1	Sandhill Crane	1	0	Flying	W	Y
	6/26/2021	13:40:16	13:40:16	M	6260335	6260335	1	Sandhill Crane	1	0	Flying	E	N
	6/27/2021	07:00:00	07:00:00	T	6270433	6270433	1	Arctic Ground Squirrel	1	0	Standing	NA	N
	6/27/2021	08:39:10	08:39:10	M	6270441	6270441	1	Uncategorized Bird	1	0	Flying	W	N
	6/27/2021	16:55:21	16:55:21	M	6270490	6270490	1	Arctic Ground Squirrel	1	0	Sitting	NA	N
	6/27/2021	21:30:00	21:30:00	T	6270517	6270517	1	Arctic Ground Squirrel	1	0	Sitting	NA	N
	6/28/2021	06:30:00	06:30:00	T	6280546	6280546	1	Uncategorized Bird	2	0	Flying	W	N
	6/28/2021	10:26:25	10:26:25	M	6280560	6280560	1	Caribou	1	0	Walking	W	Y
	6/28/2021	14:57:55	14:58:00	M	6280604	6280605	2	Uncategorized Bird	2	0	Flying	W	N
	6/29/2021	04:30:00	04:30:00	T	6290647	6290647	1	Uncategorized Bird	1	0	Flying	E	N
	6/29/2021	21:00:00	21:00:00	T	6290742	6290742	1	Sandhill Crane	1	0	Walking	E	Y
	6/30/2021	06:29:15	06:29:15	M	6300770	6300770	1	Caribou	1	0	Walking	NW	Y
	6/30/2021	12:23:31	12:23:31	M	6300793	6300793	1	Sandhill Crane	2	0	Flying	E	N

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
3	6/30/2021	15:33:52	15:33:52	M	6300807	6300807	1	Sandhill Crane	3	0	2 Flying 1 about to fly	E	N
(cont'd)	7/1/2021	13:30:00	13:30:00	T	7010890	7010890	1	Sandhill Crane	1	0	Standing	NW	Y
	7/1/2021	14:13:27	14:13:32	M	7010892	7010893	2	Raptor	5	0	Flying	E	N
	7/2/2021	08:30:00	08:30:00	T	7020982	7020982	1	Sandhill Crane	1	0	walking	SW	N
	7/2/2021	10:40:24	10:40:24	M	7020991	7020991	1	Sandhill Crane	3	0	Flying	E	N
	7/2/2021	10:46:20	10:46:20	M	7020993	7020993	1	Sandhill Crane	2	0	Standing and flying	N	Y
	7/2/2021	15:53:08	15:53:17	M	7020034	7020035	2	Uncategorized Bird	2	0	Flying	E	N
	7/3/2021	10:23:21	10:23:21	M	7030129	7030129	1	Uncategorized Bird	1	0	Flying	SW	N
	7/3/2021	11:31:58	11:32:02	M	7030135	7030136	2	Waterfowl	1	0	Flying	E	N
	7/3/2021	12:48:20	12:48:20	M	7030144	7030144	1	Uncategorized Bird	1	0	Flying	E	N
	7/4/2021	17:58:17	17:58:17	M	7040354	7040354	1	Uncategorized Bird	2	0	Flying	E	N
	7/4/2021	21:28:03	21:28:03	M	7040384	7040384	1	Sandhill Crane	1	0	Flying	E	Y
	7/5/2021	09:55:46	09:55:46	M	7050426	7050426	1	Uncategorized Bird	4	0	Flying	W	Y
	7/5/2021	10:43:06	10:43:06	M	7050429	7050429	1	Uncategorized Bird	1	0	Flying	NA	N
	7/8/2021	19:30:00	19:30:00	T	7080987	7080987	1	Uncategorized Bird	1	0	Flying	E	N
	7/9/2021	14:52:52	14:52:52	M	7090106	7090106	1	Uncategorized Bird	1	0	Flying	E	N
	7/10/2021	08:43:46	08:43:46	M	7100214	7100214	1	Uncategorized Bird	2	0	Flying	NA	N
	7/10/2021	14:11:53	14:11:53	M	7100252	7100252	1	Sandhill Crane	4	0	Flying	E	Y
	7/10/2021	14:49:13	14:49:13	M	7100260	7100260	1	Uncategorized Bird	1	0	Flying	E	N
	7/10/2021	22:00:00	22:01:49	T	7100336	7100337	2	Arctic Ground Squirrel	1	0	Sitting	NA	N
	7/11/2021	11:00:00	11:00:00	T	7110408	7110408	1	Uncategorized Bird	2	0	Flying	E	N
	7/11/2021	12:09:56	12:09:56	M	7110419	7110419	1	Uncategorized Bird	1	0	Flying	E	N
	7/11/2021	14:21:37	14:21:37	M	7110442	7110442	1	Uncategorized Bird	1	0	Flying	E	N
	7/12/2021	09:24:39	09:24:39	M	7120559	7120559	1	Uncategorized Bird	2	0	Flying	E	N
4	6/26/2021	11:49:29	11:49:29	M	6260146	6260146	1	Sandhill Crane	1	0	Standing	E	N
	6/27/2021	14:00:00	14:00:00	M	6270207	6270207	1	Arctic Fox	1	0	Walking	NE	N
	6/27/2021	21:18:34	21:18:34	M	6270223	6270223	1	Arctic Fox	1	0	Walking	NW	N
	6/28/2021	16:00:00	16:00:00	T	6280263	6280263	1	Arctic Ground Squirrel	1	0	Standing	NA	Y
	6/29/2021	19:00:00	19:00:00	T	6290362	6290362	1	Songbird	1	0	Standing	S	Y
	7/10/2021	07:00:00	07:41:35	T	7100193	7100195	3	Uncategorized Bird	2	0	Flying	E	N
5	7/1/2021	14:50:26	22:00:00	M	7010813	7010853	41	Caribou	-250	Unkown	Walking and Feeding	W	N
	7/3/2021	09:20:13	09:20:13	M	7030003	7030003	1	Caribou	1	0	Walking	E	N
	7/3/2021	17:51:45	17:51:45	M	7030071	7030071	1	Uncategorized Bird	2	0	Flying	E	N
	7/5/2021	08:00:00	08:00:00	T	7050257	7050257	1	Uncategorized Bird	1	0	Flying	E	N
	7/8/2021	09:20:11	09:20:11	M	7080691	7080691	1	Uncategorized Bird	1	0	Flying	E	N
	7/9/2021	06:00:00	06:00:00	T	7090823	7090823	1	Uncategorized Bird	2	0	Flying	E	N
	7/9/2021	08:24:24	08:30:00	M	7090846	7090847	2	Uncategorized Bird	1	0	Flying	W	N
	7/10/2021	06:00:00	06:00:00	T	7100009	7100009	1	Caribou	1	0	Feeding	E	N

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
6	6/27/2021	08:00:00	08:00:00	T	6270444	6270444	1	Caribou	1	0	Standing	E	N
	7/1/2021	03:42:36	03:46:29	M	7010864	7010865	2	Caribou	2	0	Feeding	E	Y
	7/1/2021	17:30:00	18:58:44	T	7010926	7010935	10	Caribou	20	0	Feeding	E	N
	7/6/2021	14:46:50	14:46:57	M	7060644	7060645	2	Uncategorized Bird	1	0	Flying	W	N
	7/8/2021	08:53:12	08:53:17	M	7080918	7080919	2	Uncategorized Bird	1	0	Standing	NA	N
7	6/26/2021	06:00:00	06:00:00	T	6260190	6260190	1	Waterfowl	2	0	Feeding	NA	N
	6/29/2021	02:51:41	02:51:41	M	6290355	6290355	1	Caribou	1	0	Feeding	E	N
	7/1/2021	00:43:16	00:43:21	M	7010449	7010450	2	Caribou	1	0	Feeding	W	N
	7/1/2021	11:48:08	11:48:08	M	7010473	7010473	1	Sandhill Crane	2	0	Walking	W	N
	7/8/2021	13:30:00	13:30:00	T	7080824	7080824	1	Sandhill Crane	1	0	Walking	W	Y
	7/10/2021	11:30:00	11:30:00	T	7100916	7100916	1	Sandhill Crane	1	0	Walking	W	Y
8	6/23/2021	21:03:26	21:03:26	M	6230056	6230056	1	Arctic Fox	1	0	Walking	E	Y
	6/30/2021	09:30:00	09:30:00	T	6300907	6300907	1	Gull	1	0	Flying	E	N
	7/1/2021	14:00:00	14:38:18	T	7010989	7010994	6	Caribou	5	Unkown	Feeding	W	N
	7/1/2021	18:56:19	20:30:00	M	7010020	7010031	12	Caribou	-100	Unkown	Feeding	W	N
	7/3/2021	12:30:00	12:30:00	T	7030181	7030181	1	Songbird	2	0	Standing	NA	N
	7/4/2021	14:06:24	14:06:24	M	7040349	7040349	1	Uncategorized Bird	1	0	Flying	NA	N
9	7/2/2021	21:02:27	21:02:27	M	7020035	7020035	1	Uncategorized Bird	1	0	Flying	W	N
	7/2/2021	09:30:00	09:30:00	T	7020940	7020940	1	Caribou	1	0	Walking	W	Y
	7/3/2021	12:16:08	12:16:08	M	7030082	7030082	1	Uncategorized Bird	1	0	Flying	E	N
	7/4/2021	14:00:00	14:00:00	T	7040247	7040247	1	Uncategorized Bird	1	0	Flying	E	N
	7/6/2021	10:00:00	11:00:00	T	7060496	7060502	7	Uncategorized Bird	1	0	Standing	NA	N
	7/7/2021	18:11:44	18:11:52	M	7070747	7070749	3	Uncategorized Bird	1	0	Flying	W	N
	7/7/2021	22:30:00	22:30:00	T	7070771	7070771	1	Uncategorized Bird	2	0	Walking	E	N
	7/11/2021	16:14:28	16:14:28	M	7110450	7110450	1	Uncategorized Bird	1	0	Flying	W	N
	7/12/2021	08:43:06	08:48:12	M	7120538	7120539	2	Uncategorized Bird	1	0	Flying	W	N
10	6/27/2021	10:00:00	10:00:00	T	6270196	6270196	1	Uncategorized Bird	2	0	Flying	NA	N
	6/30/2021	04:00:00	04:00:00	T	6300331	6300331	1	Songbird	1	0	Sitting	NA	N
	6/30/2021	05:00:00	05:00:00	T	6300333	6300333	1	Uncategorized Bird	1	0	Flying	NA	N
	7/4/2021	03:00:00	03:30:00	T	7040530	7040535	6	Caribou	3	0	Grazing	W	Y
	7/9/2021	17:58:40	17:58:40	M	7090813	7090813	1	Arctic Ground Squirrel	1	0	Walking	E	N
	7/13/2021	03:30:00	03:30:00	T	7130983	7130983	1	Uncategorized Bird	1	0	Flying	E	N
11	6/25/2021	18:00:00	18:00:00	T	6250111	6250111	1	Arctic Ground Squirrel	1	0	Walking	NA	Y
	7/1/2021	07:22:10	08:30:00	M	7010399	7010416	18	Caribou	-20	5	Feeding	W	N
	7/2/2021	15:00:00	15:30:00	T	7020482	7020508	27	Caribou	50-75	25	Feeding	E	Y
	7/3/2021	10:00:00	10:00:00	T	7030548	7030548	1	Songbird	1	0	Siting	NA	N
	7/11/2021	05:30:00	05:30:00	T	7110928	7110928	1	Arctic Ground Squirrel	1	0	Siting	NA	N

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
12	6/27/2021	14:00:00	14:00:00	T	6270205	6270205	1	Gull	1	0	Flying	W	N
	6/30/2021	01:06:58	01:06:58	M	6300324	6300324	1	Uncategorized Mammal	1	0	Running	E	N
	7/1/2021	04:00:00	08:00:00	T	7010382	7010425	44	Caribou	-30	-5	Feeding	E	Y
	7/4/2021	07:03:15	07:03:15	M	7040600	7040600	1	Arctic Hare	1	0	Running	W	N
	7/10/2021	20:00:00	20:00:00	T	7100917	7100917	1	Uncategorized Bird	1	0	Flying	NA	N
13	6/24/2021	19:00:00	19:00:00	T	6240063	6240063	1	Waterfowl	4	0	Standing	NA	N
	6/26/2021	00:30:00	01:00:00	T	6260124	6260127	4	Arctic Hare	1	0	Grazing	NA	Y
	6/29/2021	01:00:00	01:00:00	T	6290273	6290273	1	Uncategorized Mammal	1	0	Laying	NA	N
	6/29/2021	21:00:00	21:00:00	T	6290313	6290313	1	Gull	1	0	Standing	NA	N
	7/1/2021	03:59:05	06:01:54	M	7010382	7010396	15	Caribou	30	8	Grazing	E	Y
	7/1/2021	07:00:00	08:30:00	T	7010398	7010403	6	Caribou	20	4	Grazing	E	Y
	7/1/2021	10:00:00	10:00:00	T	7010409	7010409	1	Caribou	3	0	Grazing	W	N
	7/1/2021	20:54:18	22:30:00	M	7010431	7010448	18	Caribou	25	10	Grazing	W	Y
	7/1/2021	23:30:00	00:55:39	T	7020450	7020455	6	Caribou	-30	5	Grazing	W	Y
	7/2/2021	02:18:28	02:40:13	M	7020462	7020469	8	Caribou	-11	4	Grazing	E	Y
	7/2/2021	10:30:00	10:30:00	T	7020485	7020485	1	Caribou	1	1	Standing	W	Y
	7/2/2021	11:30:00	11:30:00	T	7020487	7020487	1	Caribou	15	-12	Walking/Grazing	W	Y
	7/8/2021	21:00:00	21:00:00	T	7080809	7080809	1	Uncategorized Bird	3	0	Flying	W	NA
	7/9/2021	13:00:00	13:00:00	T	7090841	7090841	1	Uncategorized Bird	1	0	Flying	E	NA
	7/10/2021	06:30:00	06:30:00	T	7100879	7100879	1	Sandhill Crane	2	0	Walking/Grazing	W	NA
15	6/27/2021	04:00:00	04:00:00	T	6270347	6270347	1	Waterfowl	1	0	Standing	NA	N
	6/30/2021	14:18:40	14:18:40	M	6300689	6300689	1	Uncategorized Mammal	10	0	Walking	W	Y
	6/30/2021	17:30:00	18:00:00	M	6300697	6300706	10	Caribou	-20	5	Walking	W	Y
	6/30/2021	20:03:10	20:04:17	M	6300715	6300716	2	Caribou	5	2	Walking	E	Y
	7/1/2021	09:00:00	09:00:00	T	7010750	7010750	1	Caribou	-40	Unkown	Grazing	E	Y
	7/2/2021	12:30:00	12:30:00	T	7020890	7020890	1	Caribou	-20	Unkown	Laying	E	N
	7/2/2021	15:30:00	16:14:37	T	7020898	7020923	26	Caribou	-50	Unkown	Walking	E	Y
	7/2/2021	17:29:35	17:29:35	M	7020928	7020928	1	Caribou	3	0	Running	W	Y
	7/3/2021	07:36:41	07:36:41	T	7030966	7030966	1	Arctic Fox	1	0	Walking	E	Y
	7/6/2021	10:30:00	10:30:00	T	7060353	7060353	1	Uncategorized Bird	1	0	Flying	NA	N
	7/6/2021	10:52:03	10:52:03	M	7060355	7060355	1	Uncategorized Bird	1	0	Flying	NA	N
	7/8/2021	06:32:46	06:32:46	M	7080655	7080655	1	Arctic Fox	1	0	Walking	W	Y
	7/10/2021	08:12:24	08:23:19	M	7100991	7100992	2	Uncategorized Bird	1	0	Flying	NA	N
	7/10/2021	15:10:35	15:10:35	M	7100050	7100050	1	Uncategorized Bird	1	0	Flying	NA	N
16	6/29/2021	01:14:26	01:30:00	M	6290680	6290681	2	Caribou	12	0	Walking	East	Y
	6/29/2021	03:00:00	04:17:28	T	6290684	6290693	10	Caribou	19	0	Walking	East	Y
	6/29/2021	04:39:49	05:00:00	M	6290695	6290708	14	Caribou	2	0	Walking, Grazing	North	Y
	6/29/2021	05:24:56	05:30:00	M	6290709	6290716	8	Caribou	23	9	Walking	West	Y

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
16	6/29/2021	05:57:05	06:30:00	M	6290617	6290733	17	Caribou	6	0	Walking/Grazing	East	Y
(cont'd)	6/29/2021	07:30:00	08:47:57	T	6290735	6290762	28	Caribou	20	4	Walking/Grazing	East	Y
	6/29/2021	08:51:12	09:27:38	M	6290763	6290787	25	Caribou	86	36	Walking/Grazing	East	Y
	6/29/2021	09:33:33	09:34:50	M	6290789	6290972	4	Caribou	3	3	Walking	East	N
	6/29/2021	09:46:12	09:47:08	M	6290793	6290794	2	Caribou	1	1	Walking	East	Y
	6/29/2021	17:08:43	17:12:19	M	6290819	6290285	7	Caribou	12	4	Walking	East	Y
	6/29/2021	17:15:08	17:20:55	M	6290826	6290828	3	Caribou	11	4	Walking	East	Y
	6/29/2021	17:25:42	18:00:00	M	6290829	6290833	5	Caribou	18	5	Walking, Grazing	East/North	Y
	6/29/2021	18:02:18	18:02:22	M	6290834	6290385	2	Caribou	32	12	Running	West	N
	6/29/2021	23:00:00	23:00:00	T	6290851	6290851	1	Caribou	4	0	Walking	East/North	Y
	6/29/2021	23:27:56	00:00:00	M	6290852	6290871	14	Caribou	61	27	Walking	East	Y
	6/30/2021	09:05:36	09:08:54	M	6300894	6300902	9	Caribou	27	15	Walking	East	Y
	6/30/2021	11:00:00	11:34:13	T	6300914	6300942	26	Caribou	~150	~60	Walking/Running	East	Y
	6/30/2021	12:00:00	12:00:00	T	6300943	6300943	1	Caribou	5	1	Walking	East	Y
	6/30/2021	17:49:04	17:49:04	M	6300972	6300972	1	Caribou	7	3	Running	East	Y
	7/2/2021	04:00:00	04:00:00	T	7020115	7020115	1	Waterfowl	2	0	NA	NA	NA
	7/4/2021	03:00:00	03:00:00	T	7040367	7040367	1	Sandhill Crane	1	0	NA	NA	NA
17	6/23/2021	05:30:00	05:30:00	T	6240072	6240072	1	Waterfowl	2	0	NA	NA	NA
	6/28/2021	08:26:29	08:26:34	M	6280476	6280477	2	Caribou	1	0	Walking	West	N
	6/30/2021	08:00:00	10:18:47	T	6300677	6300723	47	Caribou	119	57	Walking, Grazing	East	Y
	6/30/2021	14:00:00	14:25:05	T	6300736	6300741	5	Caribou	12	0	Walking	East	Y
	6/30/2021	16:00:00	16:12:14	T	6300746	6300747	2	Caribou	17	7	Walking	North	Y
	6/30/2021	17:00:00	17:30:00	T	6300749	6300750	2	Caribou	~50	0	Walking	Northeast	N
	6/30/2021	17:44:49	17:51:16	M	6300751	6300755	5	Caribou	10	3	Walking	East	Y
	6/30/2021	19:08:48	19:16:06	M	6300763	6300775	13	Caribou	53	28	Walking	North/East	Y
	6/30/2021	22:00:00	23:03:50	T	6300785	300788	4	Caribou	~120	NA	Walking	Northeast	Y
	7/1/2021	06:00:00	06:51:12	T	7010805	7010807	3	Caribou	8	0	Walking	East	Y
	7/1/2021	08:46:35	09:17:37	M	7010813	7010848	36	Caribou	40	21	Walking, Grazing	East	Y
	7/1/2021	09:47:11	09:47:11	M	7010850	7010850	1	Caribou	18	10	Walking	East	N
	7/1/2021	18:00:00	18:49:29	T	7010885	7010890	7	Caribou	~175	NA	Walking	East	Y
	7/2/2021	09:46:36	09:55:59	M	7020938	7021000	63	Caribou	84	56	Walking, Grazing	Northeast	Y
	7/2/2021	09:56:04	09:57:01	M	7020001	7020008	8	Caribou	14	12	Walking	East	Y
	7/2/2021	14:00:00	15:25:03	T	7020042	7020086	45	Caribou	55	24	Walking	East	Y
	7/2/2021	15:39:48	15:39:48	M	7020088	7020088	1	Caribou	2	0	Walking	West	Y
	7/2/2021	17:30:00	17:31:11	T	7020119	7020120	2	Caribou	2	1	Walking	East	Y
	7/2/2021	20:30:00	20:30:00	T	7020130	7020130	1	Caribou	~20	NA	Walking	Northeast	Y
	7/3/2021	04:29:00	04:29:00	M	7030152	7030152	1	Caribou	1	1	Running	West	Y
	7/3/2021	19:46:03	19:46:03	M	7030235	7030235	1	Caribou	~15	NA	Walking	East	N
	7/6/2021	13:42:13	13:42:13	M	7060605	7060605	1	Gull	1	0	NA	NA	NA

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
18	6/30/2021	04:00:00	04:30:00	T	6300323	6300324	2	Caribou	5	0	Walking	East	Y
	6/30/2021	05:30:00	10:18:44	T	6300326	6300392	66	Caribou	284	41	Walking	Southeast	Y
	6/30/2021	08:45:59	08:45:59	M	6300348	6300349	2	Waterfowl	2	0	NA	NA	NA
	6/30/2021	08:53:11	08:53:11	M	6300355	6300355	1	Uncategorized Bird	2	0	NA	NA	NA
	6/30/2021	15:30:00	15:30:00	T	6300403	6300403	1	Caribou	1	0	Walking	East	Y
	6/30/2021	17:00:00	18:00:00	T	6300406	6300408	3	Caribou	~100	NA	Walking	East	Y
	6/30/2021	21:56:04	03:00:00	M	6300417	7010467	51	Caribou	~200	~59	Walking	East	Y
	7/1/2021	08:22:47	08:25:44	M	7010478	7010501	24	Caribou	23	12	Walking, Grazing	East	Y
	7/1/2021	09:30:00	09:30:00	T	7010504	7010504	1	Caribou	7	6	Walking	South	Y
	7/1/2021	09:36:05	09:51:34	M	7010505	7010512	8	Caribou	10	6	Walking	East	Y
	7/1/2021	17:30:00	17:30:00	T	7010528	7010528	1	Caribou	~90	NA	Walking	East	Y
	7/1/2021	18:15:15	18:44:53	M	7010530	7010573	43	Caribou	328	157	Walking/Running	East	Y
	7/2/2021	14:00:00	14:00:00	T	7020613	7020613	1	Caribou	8	2	Standing, Grazing	NA	N
	7/2/2021	14:54:28	14:54:36	M	7020615	7020616	2	Caribou	1	0	Walking	East	N
	7/2/2021	22:49:48	22:50:10	M	7020633	7020637	5	Caribou	12	8	Running	West	Y
	7/3/2021	20:00:00	20:30:00	T	7020683	7020684	2	Caribou	~60	NA	Walking	East	Y
	7/4/2021	15:30:00	15:30:00	T	7020784	7020784	1	Caribou	1	0	Standing	NA	N
	7/8/2021	05:59:18	05:59:18	M	7080898	7080898	1	Arctic Fox	1	0	NA	NA	NA
	7/8/2021	22:25:26	22:25:26	M	7080931	7080931	1	Arctic Fox	1	0	NA	NA	NA
	7/8/2021	07:36:16	07:36:16	M	7090951	7090951	1	Arctic Fox	1	0	NA	NA	NA
19	6/30/2021	00:40:11	00:44:54	M	6300319	6300331	13	Caribou	49	7	Walking	East	Y
	6/30/2021	03:30:00	03:48:26	T	6300337	6300349	12	Caribou	12	4	Walking	East	Y
	6/30/2021	05:00:00	08:58:35	T	6300352	6300473	122	Caribou	170	61	Walking	East	Y
	6/30/2021	09:30:00	09:30:00	T	6300475	6300475	1	Caribou	9	4	Standing	NA	N
	6/30/2021	17:50:17	18:02:44	M	6300492	6300534	42	Caribou	185	108	Walking	East	Y
	6/30/2021	20:00:00	20:00:00	T	6300538	6300538	1	Caribou	1	0	Walking	East	Y
	7/1/2021	04:02:25	04:02:25	M	7010556	7010556	1	Caribou	2	1	Running	West	N
	7/1/2021	07:30:00	07:30:00	T	7010563	7010563	1	Caribou	13	6	Walking	East	Y
	7/1/2021	07:44:46	07:52:48	M	7010564	7010580	14	Caribou	30	14	Walking	East	Y
	7/1/2021	11:30:00	12:40:23	T	7010588	7010622	34	Caribou	59	26	Walking	East	Y
	7/1/2021	15:20:39	15:22:59	M	7010628	7010631	4	Caribou	42	25	Wakling/Running	West	Y
	7/3/2021	23:25:41	23:25:51	M	7030745	7030747	3	Caribou	1	1	Walking/Running	East	N
	7/9/2021	19:00:00	19:00:00	T	7090028	7090028	1	Sandhill Crane	2	0	NA	NA	NA
21	6/27/2021	05:07:26	05:07:26	M	6270146	6270146	1	Arctic Fox	1	0	NA	NA	NA
	6/30/2021	00:22:47	00:30:00	M	6300282	6300288	7	Caribou	31	7	Walking/Running	South	Y
	6/30/2021	05:30:00	06:03:49	T	6300298	6300300	3	Caribou	9	5	Walking	West	Y
	6/30/2021	07:32:06	08:15:08	M	6300304	6300340	36	Caribou	20	14	Walking	East	Y

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
21	7/1/2021	02:47:20	02:49:54	M	7010380	7010384	5	Caribou	5	4	Walking	East	Y
(cont'd)	7/1/2021	11:30:00	11:34:41	T	7010402	7010404	3	Caribou	4	4	Walking	South	Y
	7/2/2021	11:00:00	11:00:00	T	7020452	7020452	1	Songbird	1	0	NA	NA	NA
	7/5/2021	11:30:00	11:30:00	T	7050602	7050602	1	Gull	1	0	NA	NA	NA
22	6/29/2021	17:00:00	17:00:00	T	6290264	6290264	1	Uncategorized Bird	10	0	NA	NA	NA
	6/30/2021	03:30:00	04:00:00	T	6300285	6300286	2	Caribou	~15	NA	Walking	West	N
	7/1/2021	09:00:00	10:00:04	T	7010345	7010359	14	Caribou	17	1	Walking	East	N
	7/1/2021	11:00:00	11:30:00	T	7010361	7010362	2	Caribou	~35	NA	Walking, Grazing	East	Y
	7/1/2021	11:56:57	12:09:40	M	7010363	7010403	40	Caribou	8	5	Walking	East	Y
	7/1/2021	13:37:21	13:45:09	M	7010407	7010414	8	Caribou	6	3	Walking, Grazing	East	N
	7/1/2021	14:30:00	14:30:00	T	7010416	7010416	1	Caribou	1	0	Grazing	NA	N
	7/3/2021	11:00:00	11:00:00	T	7030507	7030507	1	Uncategorized Bird	1	0	NA	NA	NA
	7/3/2021	20:02:40	20:02:40	M	7030526	7030526	1	Arctic Fox	1	0	NA	NA	NA
	7/7/2021	16:06:47	16:06:47	M	7070718	7070718	1	Arctic Fox	1	0	NA	NA	NA
25	6/27/2021	05:30:49	05:30:49	M	6270177	6270177	1	Waterfowl	1	0	NA	NA	NA
	6/27/2021	06:30:00	06:30:00	T	6270179	6270179	1	Uncategorized Bird	1	0	NA	NA	NA
	6/28/2021	00:00:00	01:00:00	T	6280219	6280222	4	Waterfowl	16	0	NA	NA	NA
	6/29/2021	13:00:00	14:30:00	T	6290316	6290328	12	Caribou	~250	NA	Walking	East	Y
	6/29/2021	15:15:35	15:17:30	M	6290330	6290333	4	Caribou	2	0	Walking	North	No
	6/29/2021	15:30:00	17:14:00	T	6290335	6290389	54	Caribou	151	57	Walking	Southeast	Y
	6/30/2021	02:00:00	02:00:00	T	6300407	6300407	1	Waterfowl	2	0	NA	NA	NA
	7/1/2021	08:00:00	08:00:00	T	7010472	7010472	1	Sandhill Crane	1	0	NA	NA	NA
	7/1/2021	10:20:54	11:10:21	M	7010479	7010601	122	Caribou	55	33	Walking, Grazing	East, then west	Y
	7/1/2021	15:00:00	15:00:00	T	7010609	7010609	1	Uncategorized Bird	1	0	NA	NA	NA
	7/10/2021	11:30:00	11:31:26	T	7100062	7100065	3	Caribou	15	0	Walking	West	Y
	7/12/2021	10:00:00	10:00:00	T	7120162	7120162	1	Sandhill Crane	1	0	NA	NA	NA
27	6/25/2021	13:00:00	13:00:00	T	6250083	6250083	1	Uncategorized Bird	2	0	NA	NA	NA
	6/27/2021	18:00:00	18:00:00	T	6270250	6270250	1	Sandhill Crane	2	0	NA	NA	NA
	6/27/2021	23:00:00	23:00:00	T	6270269	6270269	1	Sandhill Crane	2	0	NA	NA	NA
	6/28/2021	07:30:00	07:30:00	T	6280290	6280290	1	Sandhill Crane	2	0	NA	NA	NA
	6/28/2021	14:07:07	14:08:22	M	6280319	6280327	9	Songbird	1	0	NA	NA	NA
	6/28/2021	14:30:00	14:30:00	T	6280329	6280329	1	Sandhill Crane	1	0	NA	NA	NA
	6/29/2021	13:38:09	17:23:32	M	6290404	6290690	286	Caribou	~700	~350	Walking, Grazing	East	Y
	6/29/2021	18:30:00	18:30:00	T	6290693	6290693	1	Caribou	32	16	Walking	East	Y
	6/30/2021	21:30:00	21:20:00	T	6300774	6300774	1	Uncategorized Bird	1	0	NA	NA	NA
	7/4/2021	15:06:04	15:06:04	M	7040026	7040026	1	Uncategorized Bird	1	0	NA	NA	NA
	7/6/2021	22:30:00	22:30:00	T	7060280	7060280	1	Songbird	1	0	NA	NA	NA

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
28	6/29/2021	15:10:06	17:00:00	M	6290274	6290554	200	Caribou	241	138	Walking, Grazing	West, then East	Y
	7/2/2021	00:48:00	00:48:00	M	7020667	7020667	1	Uncategorized Mammal	1	0	NA	NA	NA
	7/4/2021	07:30:57	07:30:57	M	7040844	7040844	1	Sandhill Crane	2	1	NA	NA	NA
	7/7/2021	03:17:15	03:17:15	M	7070980	7070980	1	Arctic Hare	1	0	NA	NA	NA
	7/8/2021	06:30:00	06:30:00	T	7080036	7080036	1	Caribou	28	0	Walking	Northeast	N
	7/9/2021	15:21:21	15:21:21	M	7090103	7090103	1	Sandhill Crane	1	0	NA	NA	NA
	7/11/2021	16:30:00	16:30:00	M	7110205	7110205	1	Sandhill Crane	2	0	NA	NA	NA
29	6/26/2021	00:00:00	00:00:00	T	6260132	6260132	1	Uncategorized Mammal	2	0	NA	NA	NA
	6/28/2021	18:30:00	18:30:00	T	6280425	6280425	1	Uncategorized Mammal	1	0	NA	NA	NA
	6/28/2021	19:00:00	19:00:00	T	6280426	6280426	1	Waterfowl	2	0	NA	NA	NA
	6/28/2021	20:00:00	20:00:00	T	6280428	6280428	1	Waterfowl	4	0	NA	NA	NA
	6/29/2021	11:03:32	11:03:32	M	6290492	6290492	1	Uncategorized Bird	1	0	NA	NA	NA
	6/29/2021	11:03:40	11:03:40	M	6290494	6290494	1	Uncategorized Bird	1	0	NA	NA	NA
	6/29/2021	17:00:00	17:00:00	T	6290507	6290507	1	Caribou	3	0	Drinking	NA	N
	6/30/2021	15:30:00	15:30:00	T	6300578	6300578	1	Songbird	1	0	NA	NA	NA
	7/2/2021	05:00:00	05:00:00	T	7020680	7020680	1	Waterfowl	1	0	NA	NA	NA
	7/2/2021	15:30:00	16:00:00	T	7020724	7020726	3	Waterfowl	6	0	NA	NA	NA
	7/2/2021	21:00:00	21:00:00	T	7020755	7020755	1	Waterfowl	2	0	NA	NA	NA
	7/3/2021	03:30:00	03:30:00	T	7030770	7030770	1	Uncategorized Bird	1	0	NA	NA	NA
	7/3/2021	03:57:53	03:57:53	M	7030771	7030771	1	Uncategorized Bird	3	0	NA	NA	NA
	7/3/2021	09:39:23	09:39:29	M	7030785	7030786	2	Waterfowl	6	0	NA	NA	NA
	7/3/2021	23:30:00	23:30:20	T	7030838	7030840	3	Waterfowl	6	0	NA	NA	NA
	7/4/2021	13:30:00	13:30:00	T	7040908	7040908	1	Songbird	1	0	NA	NA	NA
	7/7/2021	04:00:00	04:00:00	T	7070261	7070261	1	Waterfowl	4	0	NA	NA	NA
	7/8/2021	16:52:34	16:52:34	M	7080501	7080501	1	Songbird	1	0	NA	NA	NA
	7/8/2021	17:01:33	17:01:33	M	7080503	7080503	1	Uncategorized Bird	1	0	NA	NA	NA
	7/9/2021	18:14:13	18:15:00	M	7090661	7090664	4	Songbird	1	0	NA	NA	NA
	7/10/2021	09:26:41	09:30:26	M	7100732	7100734	3	Songbird	3	0	NA	NA	NA
	7/10/2021	10:25:18	10:30:00	M	7100747	7100748	2	Songbird	1	0	NA	NA	NA
	7/10/2021	16:06:42	16:06:42	M	7100786	7100786	1	Arctic Hare	1	0	NA	NA	NA
	7/10/2021	16:30:00	16:30:00	T	7100974	7100974	1	Songbird	1	0	NA	NA	NA
	7/11/2021	14:49:53	14:49:53	M	7110930	7110930	1	Waterfowl	2	0	NA	NA	NA
	7/11/2021	18:00:00	18:00:00	T	7110959	7110959	1	Songbird	1	0	NA	NA	NA
	7/11/2021	20:00:00	20:00:00	T	7110969	7110969	1	Songbird	1	0	NA	NA	NA
39	6/26/2021	09:00:00	09:00:00	T	6260167	260167	1	Waterfowl	1	0	NA	NA	NA
	6/26/2021	17:30:00	17:30:00	T	6260186	6260186	1	Gull	1	0	NA	NA	NA
	6/27/2021	15:30:00	15:30:00	T	6270232	6270232	1	Gull	1	0	NA	NA	NA

Appendix A: Data from Motion-trigger Cameras

Camera No.	Date Observed	Time		Photo				Species Name	Number Adults	Number Young	Behaviour (laying, feeding, walking, running)	Direction (E-W)	Did they cross? (Y/N)
		Start	End	Type	Start	End	Trigger						
39	6/28/2021	06:30:00	06:30:00	T	6280262	6280262	1	Waterfowl	1	0	NA	NA	NA
(cont'd)	6/28/2021	15:30:00	15:30:00	T	6280280	6280280	1	Waterfowl	1	0	NA	NA	NA
	6/29/2021	13:39:43	13:55:28	M	6290325	6290367	42	Caribou	24	3	Walking, Grazing	West	Y
	6/29/2021	14:08:14	19:00:00	M	6290369	6290596	227	Caribou	~400	43	Walking, Grazing	East	Y
	6/29/2021	20:00:00	20:00:00	T	6290598	6290598	1	Caribou	1	0	Walking	North	N
	7/1/2021	13:30:00	13:30:00	T	7010683	7010683	1	Gull	1	0	NA	NA	NA
	7/2/2021	20:30:00	20:30:00	T	7020749	7020749	1	Waterfowl	1	0	NA	NA	NA
	7/3/2021	12:00:00	12:00:00	T	7030781	7030781	1	Waterfowl	1	0	NA	NA	NA
	7/4/2021	11:00:00	11:00:00	T	7040830	7040830	1	Waterfowl	1	0	NA	NA	NA
	7/5/2021	09:00:00	09:00:00	T	7050874	7050874	1	Gull	3	1	NA	NA	NA
	7/7/2021	08:00:00	08:00:00	T	7070970	7070970	1	Waterfowl	1	0	NA	NA	NA
	7/7/2021	20:00:00	20:00:00	T	7070994	7070994	1	Waterfowl	1	0	NA	NA	NA
	7/8/2021	06:13:01	06:13:01	M	7080015	7080015	1	Arctic Fox	1	0	NA	NA	NA
40	6/28/2021	19:00:00	19:30:00	T	6280401	6280402	2	Waterfowl	4	0	NA	NA	NA
	6/30/2021	03:54:21	04:23:04	M	6300515	6300525	11	Caribou	15	0	Walking, Grazing	East, then ran west	Y
	6/30/2021	11:30:00	12:52:05	T	7010603	7010606	4	Caribou	~150	~18	Walking	Southeast	Y
	7/1/2021	16:30:00	16:41:00	T	7010622	7010623	2	Caribou	2	0	Walking, Grazing	West	N
	7/4/2021	00:09:03	00:15:53	M	7040826	7040851	26	Caribou	32	6	Walking, Grazing	East	Y
	7/4/2021	03:42:27	03:52:36	M	7040860	7040894	35	Caribou	44	18	Walking, Grazing	East	Y
	7/12/2021	04:30:00	04:30:00	T	7120026	7120026	1	Arctic Fox	1	0	NA	NA	NA

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APPENDIX G

Hunter Harvest Study

MELIADINE MINE

2021 HUNTER HARVEST STUDY AND CREEL SURVEY SUMMARY REPORT

31 MARCH 2022 FINAL

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Appendix A	2021 Rankin Inlet Hunter Harvest Calendar

List of Acronyms

AWAR	All-Weather Access Road
HHS	Hunter Harvest Study
IQ	Inuit Qaujimajatuqangit
KHTO	Kangiqliniq Hunters and Trappers Organization
LSA	Local Study Area
NWMB	Nunavut Wildlife Management Board
NIRB	Nunavut Impact Review Board
RSA	Regional Study Area
TEMMP	Terrestrial Environment Management and Monitoring Program

SECTION 1 • EXECUTIVE SUMMARY

A Rankin Inlet Hunter Harvest Study (HHS) was conducted in 2020 and continued into 2021. The 2021 study included 40 participants of which 30 reported harvesting Caribou (*Rangifer tarandus*). Given an estimated 300 to 350 active hunters in the Hamlet of Rankin Inlet, the HHS represents from 9 to 10% of hunters in the community. With a total reported Caribou harvest of 670 in 2021, the total Caribou harvest in Rankin Inlet is estimated to range from 6,700 to 7,444 Caribou. This estimate is likely high because the current study attracted some of the more successful hunters (e.g., Kangiqliniq Hunters and Trappers Organization [KHTO] members) in the community and total number of active hunters may be less than 300 to 350. Future discussions with KHTO members will focus on better understanding the numbers of active hunters in Rankin Inlet.

Of Caribou harvests reported by Rankin Inlet participants in 2021, 3.7% were harvested within 5 km of the Meliadine All-Weather Access Road (AWAR), which compares to 4.5% during the Nunavut Wildlife Management Board's (NWMBs) harvest study from 1996 to 2001 (pre-construction). Harvests within the Meliadine Mine Regional Study Area in 2021 were 19.7% of the total compared to 24.8% during the NWMB study. These very preliminary numbers suggest that the presence of the AWAR and the Meliadine Mine has not increased hunting in the area.

Fourteen (14) Muskox (*Ovibos moschatus*), two (2) Wolverine (*Gulo gulo*), and 18 Wolves (*Canis lupus*) were harvested in 2021. Other harvested terrestrial mammals included Arctic Fox (*Vulpes lagopus*) and Arctic Hare (*Lepus arcticus*). In the marine environment, Ringed Seal (*Pusa hispida*; 25 individuals) was the most common species harvested followed by Beluga (*Delphinapterus leucas*; 11), Bearded Seal (*Erignathus barbatus*; 2) and Walrus (*Odobenus rosmarus*; 3).

A considerable number of bird species were harvested by Rankin Inlet participants in 2021 with Canada Goose (*Branta canadensis*; 134 individuals) and Snow Goose (*Anser caerulescens*; 126) harvested at the highest levels. Gulls (*Larus* sp.), ptarmigan (*Lagopus* sp.), Sandhill Crane (*Grus canadensis*), and Northern Pintail (*Anas acuta*) were also harvested.

Arctic Char (*Salvelinus alpinus*; 628 fish) and Lake Trout (*Salvelinus namaycush*; 216 fish) were the most common species caught by fisherman. Relatively small numbers of Arctic Cod (*Arctogadus glacialis*), Arctic Grayling (*Thymallus arcticus*), Lake Whitefish (*Coregonus clupeaformis*), and Burbot (*Lota lota*) were caught.

SECTION 2 • OVERVIEW

As outlined in the original Terrestrial Environment Management and Monitoring Program (TEMMP; Agnico Eagle 2020) and as a requirement of NIRB Project Certificate No. 006 Terms and Conditions 46 and 48, the Rankin Inlet Hunter Harvest Study (HHS) was initiated in 2020 by Agnico Eagle. The HHS is being conducted in association with the Kangiqliniq Hunters and Trappers Organization (KHTO) to monitor and document the spatial distribution, seasonal patterns, and harvest rates of hunter kills and angler catches within the Meliadine Regional Study Area (RSA).

Nunavut Environmental Consulting was contracted to work alongside the KHTO in conducting the study in 2021 and increase hunter participation. The 2021 HHS, through regular visits, contributed to developing relationships with local harvesters, the KHTO, and the Government of Nunavut, Department of Environment (GN DoE).

SECTION 3 • OBJECTIVES

The primary objective of the HHS is to monitor potential project-related effects on harvesting of wildlife by residents of Rankin Inlet. This objective is achieved by estimating the following key metrics:

1. Determining the distribution of Caribou (*Rangifer tarandus*), Muskox (*Ovibos moschatus),* Grizzly Bear (*Ursus arctos*), Polar Bear (*Ursus maritimus*), Wolf (*Canis lupus*), Wolverine (*Gulo gulo*), Arctic Fox (*Vulpes lagopus*), goose, ptarmigan, and seal harvest by residents of Rankin Inlet; and
2. Estimating the total level (or an index of) harvest by residents of Rankin Inlet.

Other objectives of the HHS include:

1. Supporting creel surveys by gathering information on Arctic Char (*Salvelinus alpinus*), Lake Trout (*Salvelinus namaycush*), Lake Whitefish (*Coregonus clupeaformis*), and Arctic Grayling (*Thymallus arcticus*) catch rates and Inuit-use patterns in the Rankin Inlet area;
2. Understanding regional distribution of hunting and fishing activity;
3. Investigating seasonal timing of hunting and fishing activity; and
4. Determining whether increased harvest and catch rates are associated with the Meliadine All-Weather Access Road (AWAR).

As discussed during consultation with stakeholders, the HHS will further seek to:

- increase and maintain the hunter and fisherman participant rate in the future of the program;
- improve resource protection;
- improve hunter and fisherman awareness and education;
- increase the integration of Inuit Qaujimajatuqangit (IQ) and Traditional Knowledge;
- increase availability of data to support a collective approach to understanding harvest; and
- assist Agnico Eagle in mitigative actions and the GN in management decisions.

SECTION 4 • METHODOLOGY

The wildlife species that are the focus of the HHS are Caribou, Muskox, Grizzly Bear, Polar Bear, Wolf, Wolverine, Arctic Fox, goose, ptarmigan, and seal; however, harvest data on other species, such as Beluga (*Delphinapterus leucas*), Common Eider (*Somateria mollissima*), and Sandhill Crane (*Grus canadensis*) are also collected. The species in the study were deliberately chosen to make data entry and collection as simple as possible. To support creel surveys, data on fish harvest (Priority species = Arctic Char, Lake Trout, Lake Whitefish, and Arctic Grayling) were also collected.

Inuit and non-Inuit residents, at least 16 years of age, are eligible to participate in the harvest survey. Harvest calendars are provided on a household basis, rather than an individual basis, to simplify data entry and collection, and reflect household hunting patterns. The harvest calendar is attractive and consists of local photographs of wildlife and Nunavut residents (see Appendix A for the 2021 Rankin Inlet calendar). Space is provided for each calendar day where harvest details can be documented.

A map is provided at the end of the calendar that delineates a 5 km^2 UTM grid around the Rankin Inlet and Meliadine mine areas, and regions indicated as important for hunting during discussions with HTO members. Each grid has a unique code to facilitate recording of information. When calendars are issued, participants or participating households are encouraged to write harvest details (e.g., number of animals, sex, age, and location (i.e., grid code) for the appropriate date on the calendar.

Participants were interviewed in person three times during the year (i.e., June 2021, October 2021, and January 2022) by the harvest study coordinator. During the January 2022 interviews, remaining data from 2021 were collected. The purpose of the interviews is to ensure all harvest data are recorded on the calendars and to collect incidental information to compliment calendar data, including notable Caribou movements, aggregations, and unique observations. Between interview periods, participants were often contacted by phone or social media to encourage recording of harvest data.

Features of the 2021 HHS included:

1) building long-term relationships between participants and researchers;
2) increasing engagement with participants on social media platforms such as Facebook and Instagram; and
3) increasing incentives for participating in the study (e.g., gas vouchers and prizes).

SECTION 5 • HISTORICAL RESULTS

The number of hunters interviewed during the comprehensive 5-year Nunavut Wildlife Harvest Study (NWMB 2005) was 327, which apparently represented 97% of all hunters in Rankin Inlet (NWMB 2005). For the purposes of this annual report, and in the absence of more specific details on hunter numbers, the total number of active hunters in Rankin Inlet was estimated to be 300 to 350. Future discussions with KHTO members will focus on getting a better sense of current numbers of active hunters.

Between 1996 and 2001, 4.5% of Caribou reported harvests were within 5 km of the Meliadine AWAR (prior to construction) and 24.8% of harvests occurred within the RSA (NWMB 2005). According to the NWMB harvest study, an average of 535 Caribou were harvested per year over the five-years between June 1996 and May 2001 (NWMB 2005).

Based on the NWMB (2005) results, highest Caribou harvests occurred from March to May and from September to November.

SECTION 6 • 2021 HUNTER HARVEST STUDY RESULTS

6.1 BARREN-LAND CARIBOU

6.1.1 Number of Hunters

The HHS included 40 participants by the end of 2021. Of the 2021 participants, Caribou harvest data were collected from 30 participants.

Based on the previous discussion of total numbers of hunters in the Hamlet of Baker Lake (Section 5 Historical Results), an estimated 300 to 350 active hunters live within the Rankin Inlet community. Discussions with Rankin Inlet HTO members in 2019 suggest the total number of hunters is over 300 but future discussions are planned. Based on these numbers, the 30 hunters reporting Caribou harvest in 2021 conservatively represent from 9 to 10% of total hunters in the community.

6.1.2 Distribution of Hunting

Figure 6.1 shows the distribution of Caribou harvest within the HHS data collection area. Hunting was concentrated in the vicinity of the Hamlet of Rankin Inlet and along the northern shore of Chesterfield Inlet. Some harvests were recorded near the Hamlet of Arviat while very few harvests were reported near the hamlets of Whale Cove and Chesterfield Inlet.

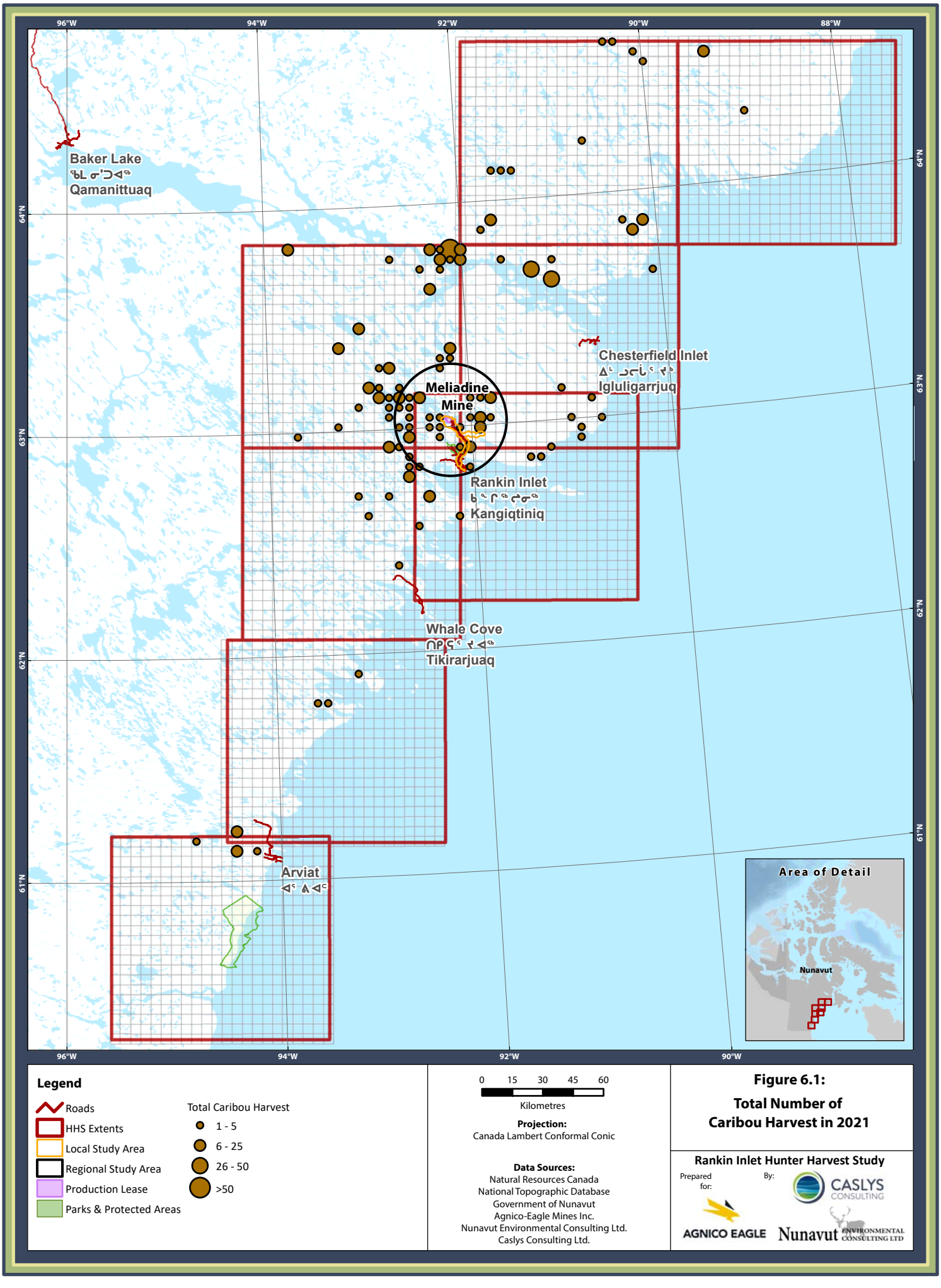
Hunting did not appear to be associated with the Meliadine AWAR. Variation in harvest location and intensity is attributable to numerous factors. For instance, hunters may have a ‘favorite’ hunting area that they frequent each year while others prefer hunting in ‘convenient’ locations. Some hunters prefer remote locations well away from frequented areas.

Figure 6.2 shows hunting distribution by community from the five-year NWMB study for the HHS study area. Most Caribou hunting occurred around the four hamlets in the study area.

The 2021 HHS data indicated that 3.7% of reported harvest occurred within 5 km of the AWAR, and 19.7% occurred within the RSA (see Table 6.1). Unlike for the Meadowbank Mine project, threshold levels for monitoring the effects of the Meliadine mine development on the distribution of Caribou harvest will not be set until three years of hunter harvest data has been collected as per TEMMP.

Table 6.1: Caribou Harvest Distribution along the AWAR and within the Rankin Inlet LSA and RSA (1996 to 2001 [NWMB], and 2021 [Rankin Inlet HHS]).

Study	Participation Rate within 5 km of AWAR (# of hunters)	Average Caribou Harvest within 5 km of AWAR per Participant	% of Annual Harvest within 5 km of AWAR	% of Annual Harvest within Meliadine LSA	% of Annual Harvest within Meliadine RSA
NWMB 1996 to 2001 (Rankin Inlet)	32	4.1	4.5	0.3	24.8
Rankin Inlet HHS 2021	5	5.0	3.7	3.3	19.7



Legend

- Roads
- HHS Extents
- Local Study Area
- Regional Study Area
- Production Lease
- Parks & Protected Areas

Total Caribou Harvest

- 1 - 5
- 6 - 25
- 26 - 50
- >50

0 15 30 45 60

Kilometres

Projection:
Canada Lambert Conformal Conic

Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.

Figure 6.1:

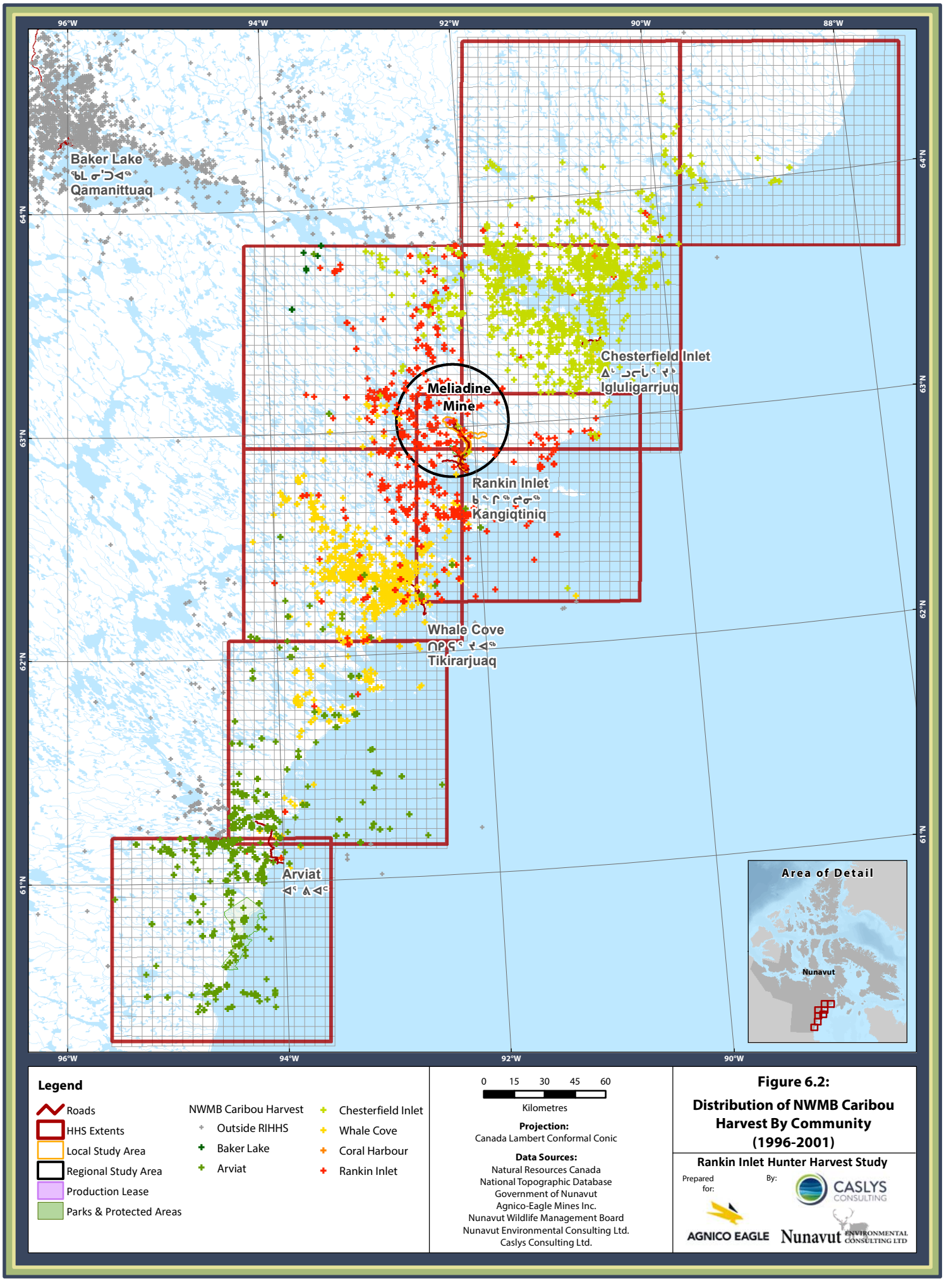
Total Number of Caribou Harvest in 2021

Rankin Inlet Hunter Harvest Study

Prepared for: AGNICO EAGLE

By: CASLYS CONSULTING; Nunavut Environmental Consulting Ltd.

2022-03-09



Legend

- Roads
- HHS Extents
- Local Study Area
- Regional Study Area
- Production Lease
- Parks & Protected Areas

NWMB Caribou Harvest

- Outside RIHHS
- Baker Lake
- Arviat
- Chesterfield Inlet
- Whale Cove
- Coral Harbour
- Rankin Inlet

0 15 30 45 60

Kilometres

Projection:
Canada Lambert Conformal Conic

Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Wildlife Management Board
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.

Figure 6.2:
Distribution of NWMB Caribou Harvest By Community (1996-2001)

Rankin Inlet Hunter Harvest Study

Prepared for: AGNICO EAGLE

By: CASLYS CONSULTING; Nunavut Environmental Consulting Ltd.

2022-03-09

6.1.3 Magnitude of Hunting

In 2021, a total of 670 Caribou were reported as being harvested by 30 participants in the Rankin Inlet HHS (see Table 6.2). Caribou harvest numbers during the five-year NWMB study for the hamlets of Rankin Inlet, Arviat, Chesterfield Inlet, and Whale Cove are also provided in Table 6.2.

Given that the 30 hunters may represent an estimated 9 to 10% of the Rankin Inlet hunting community (see Section 5 Historical Results), the total estimated number of Caribou harvested in 2021 may have been as high as 6,700 to 7,444 animals.

This estimate is very likely conservative (i.e., high) since the Rankin inlet HHS assumed a total of 300 to 350 active hunters, while the actual number is likely lower, and participants likely represented a higher proportion of successful hunters in the community.

6.1.4 Seasonal Distribution and Timing of Hunting

In 2021, HHS results indicate that the highest Caribou harvests occurred in winter (January and December), with smaller peaks in spring (April and May), and fall (September and October) (see Figure 6.3). During the five-year NWMB harvest study, the highest Caribou harvests occurred between March and May, and between September and November.

The similar pattern between the studies (other than the winter 2021 harvests) indicates that seasonal hunting preferences are similar. More details on the seasonal timing of harvest in 2021 can be found in Figure 6.4 (i.e., numbers of animals harvested, numbers of participants, and average number of animals harvested by participant by month) and Figure 6.5 (i.e., Caribou harvest numbers by season and proximity to the Meliadine AWAR). As can be seen from the latter figure, very few Caribou were harvested within 5 km of the AWAR.

The seasonal distribution of hunting in the Rankin Inlet HHS study area is illustrated in Figure 6.1, which includes all 2021 results, and Figures 6.6a to 6.6d, representing the spring, summer, fall and winter Caribou seasons.

In spring, overall Caribou hunting occurred primarily west of Rankin Inlet and the Meliadine Mine and AWAR, with some hunting in the vicinity of Arviat, between Arviat and Whale Cove, and north of Chesterfield Inlet near the calving grounds of the Lorillard Caribou Herd (Figure 6.6a).

During the summer, most Caribou were harvested near Rankin Inlet and the Meliadine Mine with hunting occurring east and west of the AWAR. Some hunting was also reported between Rankin Inlet and Chesterfield Inlet, within the Lorillard Caribou Herd range north of Chesterfield Inlet, and near the southeast end of Baker Lake at the extreme edge of the study area boundary (Figure 6.6b).

In the fall, hunting was concentrated north of Rankin Inlet within about 30 km of the Meliadine Mine but not close to the AWAR (Figure 6.6c).

In winter, Caribou were harvested across a wider area in the vicinity of Rankin Inlet and along the northern shore of Chesterfield Inlet (Figure 6.6d). Successful hunters during winter appeared to be those that travelled further afield by snowmobile.

Table 6.2: Hunter Caribou Harvest Statistics from the NWMB (2005) Study and Rankin Inlet HHS (2021).

2021 Rankin Inlet Hunter Harvest Study

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total
2021	283	36	37	78	96	0	13	14	51	27	8	27	670
Total #	283	36	37	78	96	0	13	14	51	27	8	27	670
Average	283	36	37	78	96	0	13	14	51	27	8	27	670
% of Total	42.2%	5.4%	5.5%	11.6%	14.3%	0.0%	1.9%	2.1%	7.6%	4.0%	1.2%	4.0%	100%

Nunavut Wildlife Harvest Study (NWMB 2005) – Rankin Inlet Results within the Rankin Inlet HHS Survey Area

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total
1996							35	67	67	87	138	116	510
1997	95	105	118	89	50	1	4						462
1998			117	33	6	7	15	12	72	15	15	28	320
1999	108	80	108	80	33	20	75	86	52	38	63	41	784
2000	34	35	68	111	69	29	17	40	78		30		511
2001		19	27	37	3								86
Total #	237	239	438	350	161	57	146	205	269	140	246	185	2673
Average	79.0	59.8	87.6	70.0	32.2	14.3	29.2	51.3	67.3	46.7	61.5	61.7	445.5
% of Total	8.9	8.9	16.4	13.1	6.0	2.1	5.5	7.7	10.1	5.2	9.2	6.9	100.0

Table 6.2: Continued.

Nunavut Wildlife Harvest Study (NWMB 2005) – Arviat Results within the Rankin Inlet HHS Survey Area

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total
1996						56	52	53	317	349	260	122	1209
1997	133	102	112	190	48	62	116	122	245	230	89	59	1508
1998	99	121	169	147	138	88	156	68	207	74	15	15	1297
1999	168	91	79	128	25	49	70	51	271	275	19	22	1248
2000	49	17	13	62	35	32	54	68	211	79	118	93	831
2001	44	181	6	211	159								601
Total #	493	512	379	738	405	287	448	362	1251	1007	501	311	6694
Average	98.6	102.4	75.8	147.6	81.0	57.4	89.6	72.4	250.2	201.4	100.2	62.2	1115.7
% of Total	7.4	7.6	5.7	11.0	6.1	4.3	6.7	5.4	18.7	15.0	7.5	4.6	100.0

Nunavut Wildlife Harvest Study (NWMB 2005) – Chesterfield Inlet Results within the Rankin Inlet HHS Survey Area

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total
1996						27	45	98	77	29	30	46	352
1997	112	51	89	24	17	31	31	30	71	33	150	29	668
1998	54	42	28	39	53	18	40	41	90	12	16	8	441
1999	88	40	47	16	33	21	23	37	35	18	34	27	419
2000	22	16	10	17	18	8	43	45	33	25	32	30	299
2001	17	24	37	26	24								128
Total #	293	173	211	122	145	105	182	251	306	117	262	140	2307
Average	58.6	34.6	42.2	24.4	29.0	21.0	36.4	50.2	61.2	23.4	52.4	28.0	384.5
% of Total	11.0	6.5	7.9	4.6	5.4	3.9	6.8	9.4	11.4	4.4	9.8	5.2	100.0

Table 6.2: Continued.

Nunavut Wildlife Harvest Study (NWMB 2005) – Whale Cove Results within the Rankin Inlet HHS Survey Area

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total
1996						13	25	43	58	50	82	40	311
1997	68	9	13	35	9	14	8	25	22	16	14	14	247
1998	21	11	21	22	65	21	39	31	43	19	31	19	343
1999	35	38	53	49	30	28	42	51	48	46	40	23	483
2000	27	29	15	23	20	11	42	37	42	55	56	18	375
2001	37	46	42	47	24								196
Total #	188	133	144	176	148	87	156	187	213	186	223	114	1955
Average	37.6	26.6	28.8	35.2	29.6	17.4	31.2	37.4	42.6	37.2	44.6	22.8	325.8
% of Total	7.0	5.0	5.4	6.6	5.5	3.3	5.8	7.0	8.0	7.0	8.3	4.3	100.0

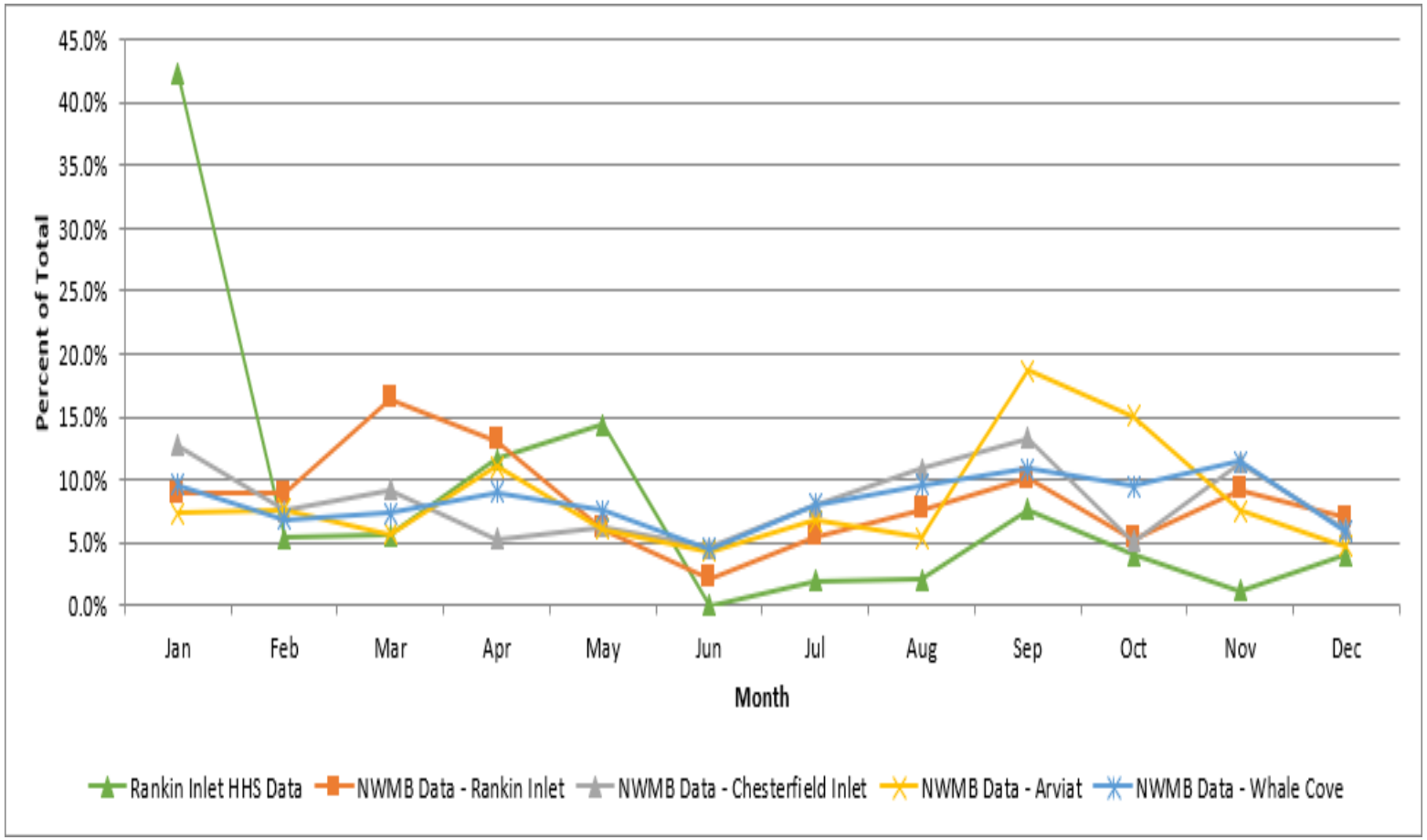


Figure 6.3: Seasonal Trends in Caribou Harvest from the Rankin Inlet Hunter Harvest Study (2021) and the NWMB Study (1996 to 2001)

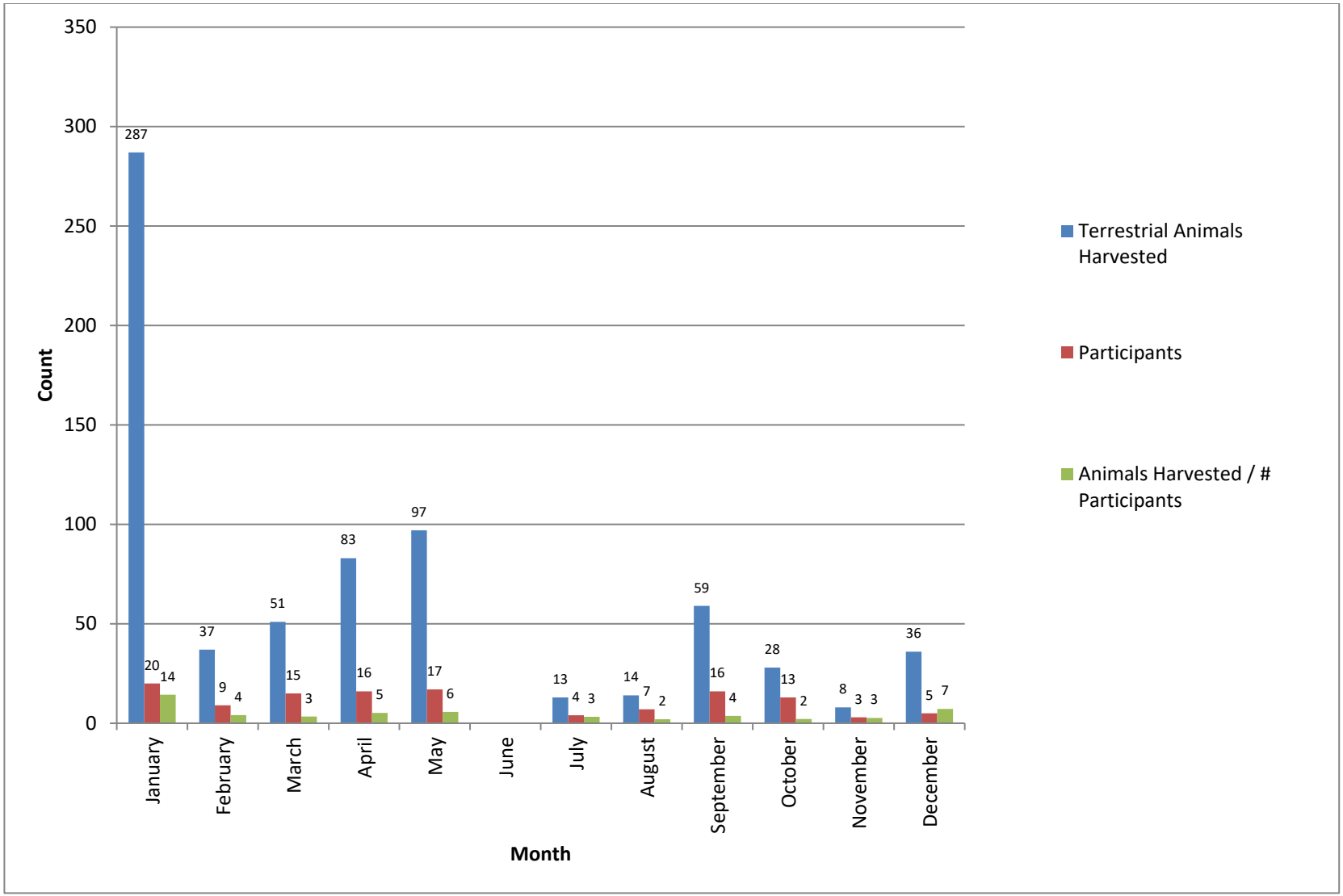


Figure 6.4: Terrestrial Animals Harvested per Month and by Participant in 2021.

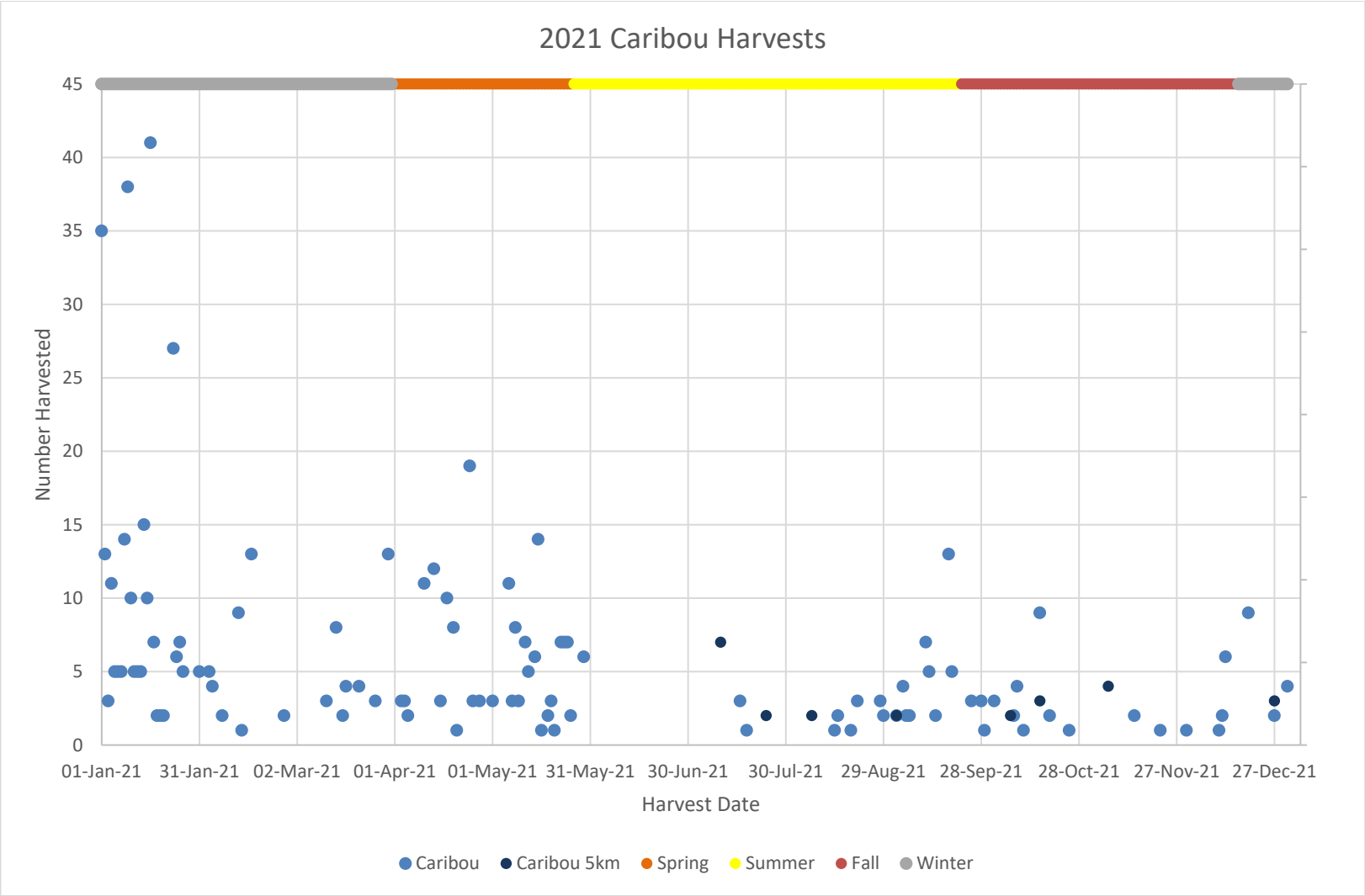
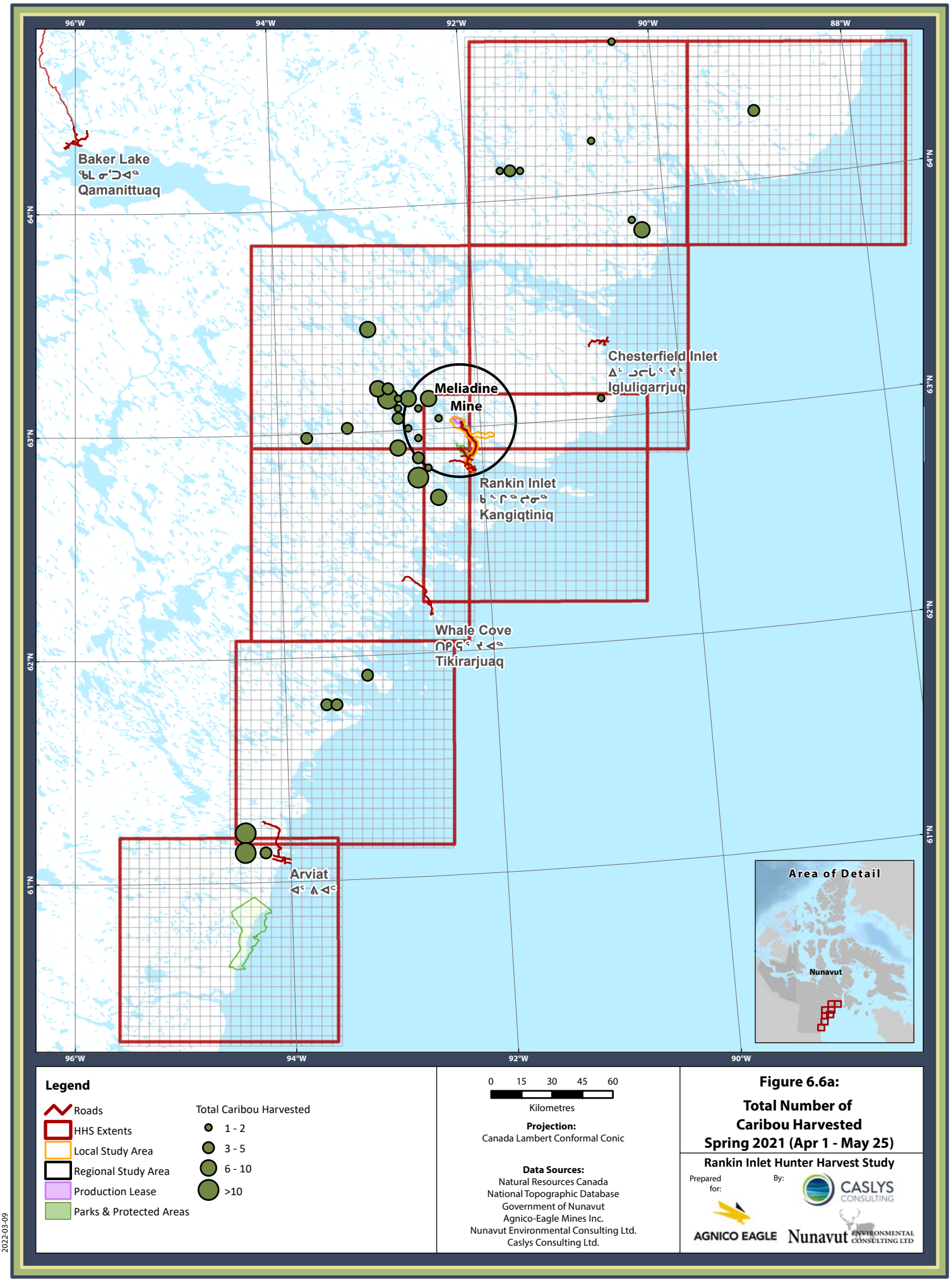


Figure 6.5: Number of Caribou Harvested in each Caribou Season and Proximity to the Meliadine All-Weather Access Road in 2021.



Legend

- Roads
- HHS Extents
- Local Study Area
- Regional Study Area
- Production Lease
- Parks & Protected Areas

Total Caribou Harvested

- 1 - 2
- 3 - 5
- 6 - 10
- >10

0 15 30 45 60

Kilometres

Projection:
Canada Lambert Conformal Conic

Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.

Figure 6.6a:

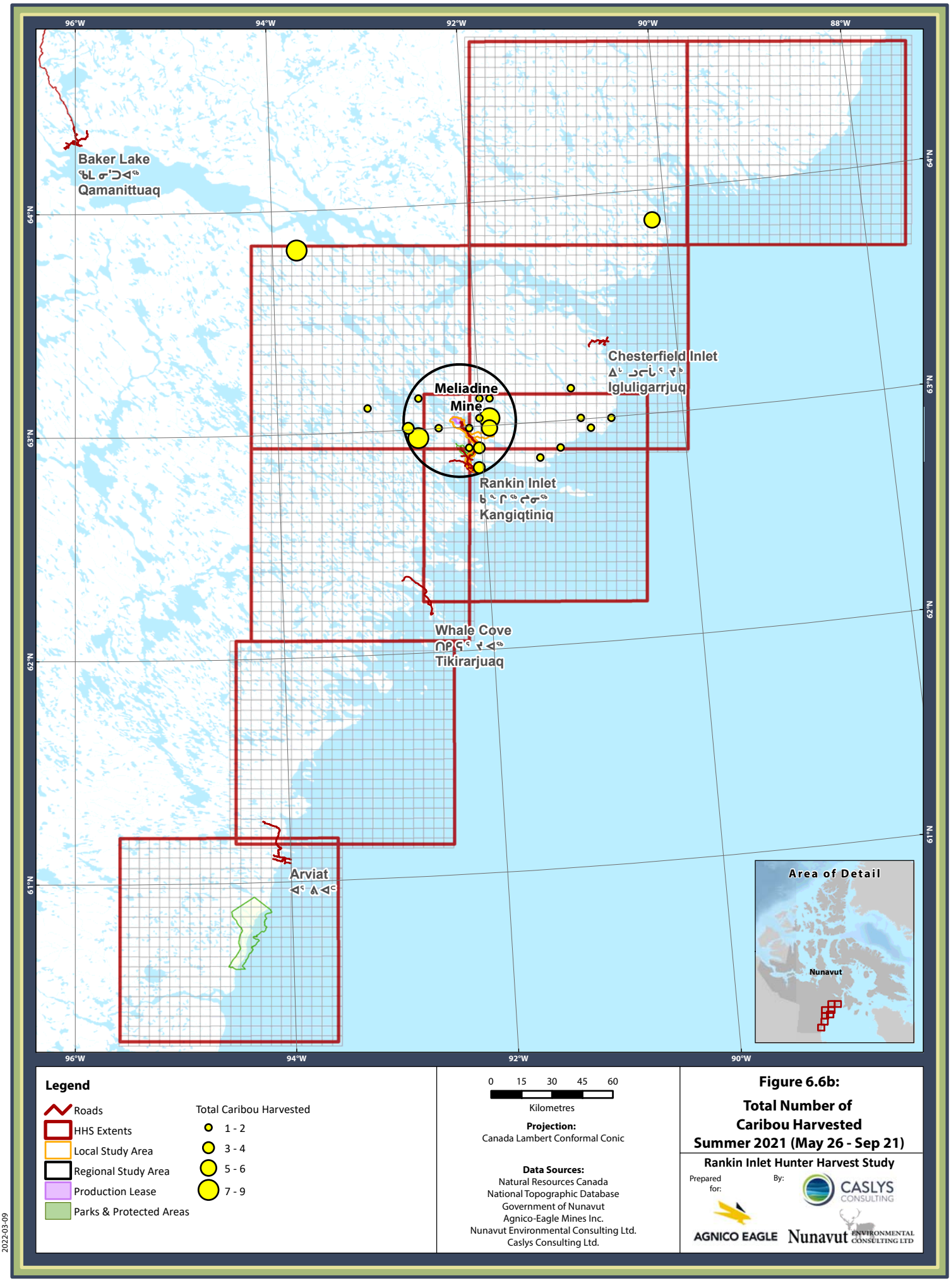
Total Number of Caribou Harvested Spring 2021 (Apr 1 - May 25)

Rankin Inlet Hunter Harvest Study

Prepared for: AGNICO EAGLE

By: CASLYS CONSULTING; Nunavut Environmental Consulting Ltd.

2022-03-09



Legend

- Roads
- HHS Extents
- Local Study Area
- Regional Study Area
- Production Lease
- Parks & Protected Areas

Total Caribou Harvested

- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 9

0 15 30 45 60

Kilometres

Projection:
Canada Lambert Conformal Conic

Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.

Figure 6.6b:

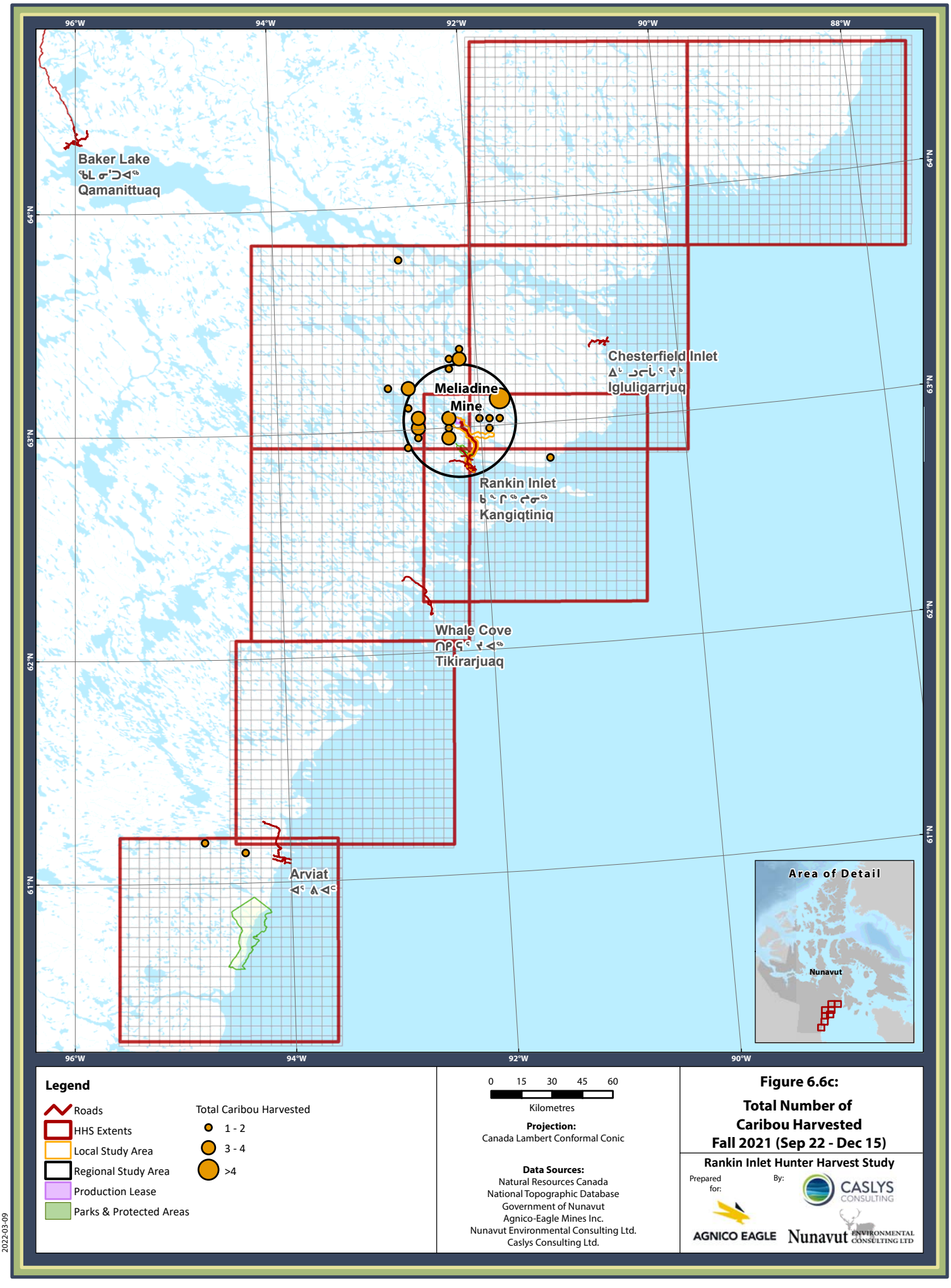
Total Number of Caribou Harvested Summer 2021 (May 26 - Sep 21)

Rankin Inlet Hunter Harvest Study

Prepared for: AGNICO EAGLE

By: CASLYS CONSULTING; Nunavut Environmental Consulting Ltd.

2022-03-09



Legend

- Roads
- HHS Extents
- Local Study Area
- Regional Study Area
- Production Lease
- Parks & Protected Areas

Total Caribou Harvested

- 1 - 2
- 3 - 4
- >4

0 15 30 45 60

Kilometres

Projection:
Canada Lambert Conformal Conic

Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.

Figure 6.6c:

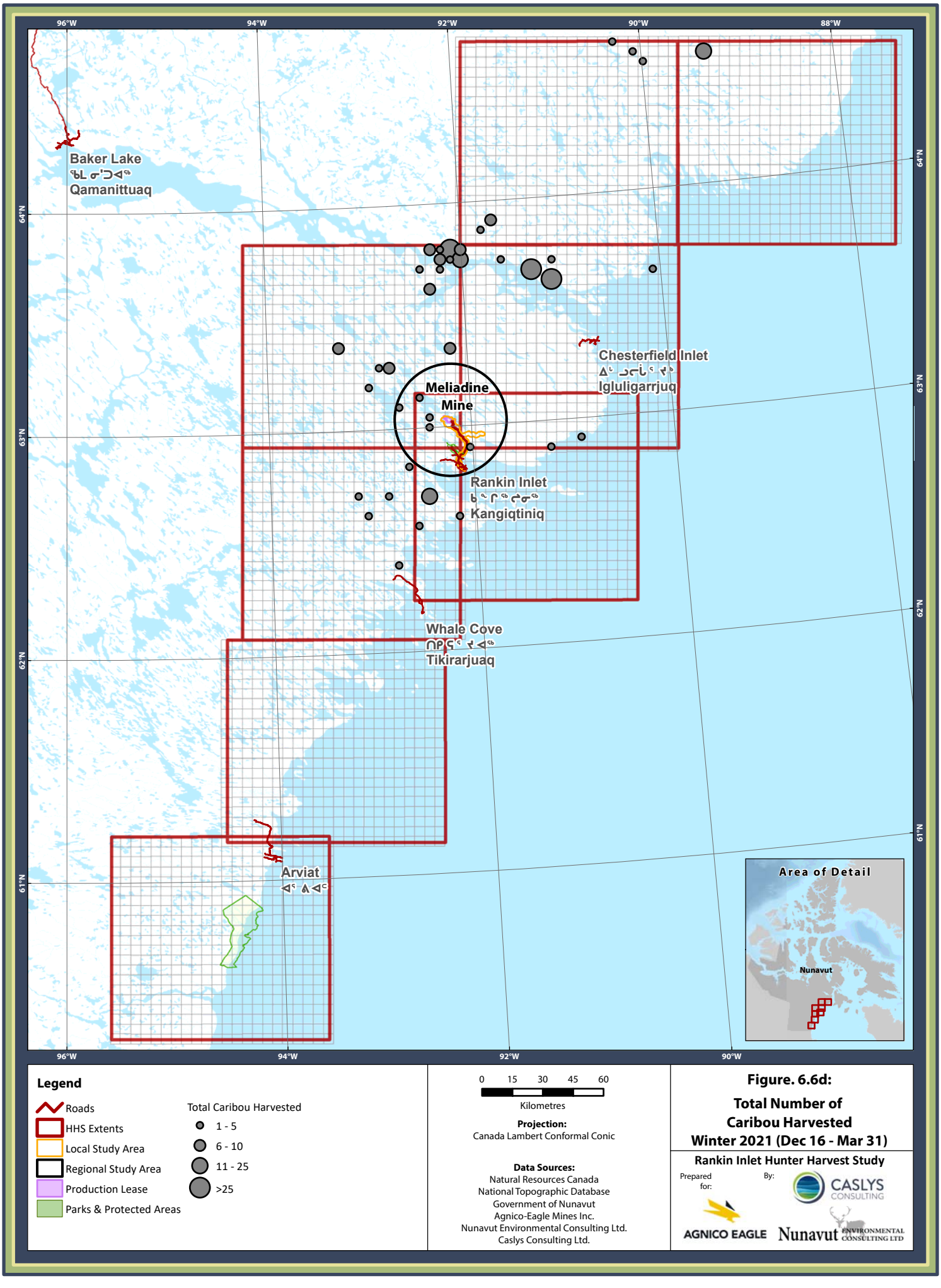
Total Number of Caribou Harvested Fall 2021 (Sep 22 - Dec 15)

Rankin Inlet Hunter Harvest Study

Prepared for: AGNICO EAGLE

By: CASLYS CONSULTING; Nunavut Environmental Consulting Ltd.

2022-03-09



Legend

- Roads
- HHS Extents
- Local Study Area
- Regional Study Area
- Production Lease
- Parks & Protected Areas

Total Caribou Harvested

- 1 - 5
- 6 - 10
- 11 - 25
- >25

0 15 30 45 60

Kilometres

Projection:
Canada Lambert Conformal Conic

Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.

Figure. 6.6d:

Total Number of Caribou Harvested Winter 2021 (Dec 16 - Mar 31)

Rankin Inlet Hunter Harvest Study

Prepared for: AGNICO EAGLE

By: CASLYS CONSULTING; Nunavut Environmental Consulting Ltd.

2022-03-09

6.2 OTHER TERRESTRIAL MAMMAL SPECIES

6.2.1 Muskox and Moose

A total of 14 Muskox harvests were reported within the Rankin Inlet HHS area in 2021. Most Muskox were harvested south and southwest of Rankin Inlet, while individuals were harvested a considerable distance northwest of Rankin Inlet and more than 100 km north of Chesterfield Inlet (see Figure 6.7) Surprisingly, one Moose (*Alces alces*) was also reported as being harvested in 2021. Moose in the study are well north of the known range.

6.2.2 Wolverine, Wolf, Grizzly Bear, and Polar Bear

The two (2) reported Wolverine harvests were more than 100 km northeast of Rankin Inlet (see Figure 6.8). Wolves (total of 18 reported in 2021) were mostly harvested along the southern and northern shores of Chesterfield Inlet (Figure 6.8). In general, relatively low densities of Wolverines and Wolves, and their general aversion to humans, requires hunters to hunt well away from the AWAR. There were no reported harvests of Grizzly Bear or Polar Bear by HHS participants in 2021.

6.2.3 Arctic Fox and Arctic Hare

Only one (1) Arctic Fox was reported as being harvested, approximately 50 km northwest of the Hamlet of Chesterfield Inlet along the south shore of Chesterfield Inlet (Figure 6.7). Seven (7) Arctic Hares were harvested near Rankin Inlet (Figure 6.7). One hunter indicated that the fur was used primarily for women's mittens.

6.3 BIRD SPECIES

A total of 394 birds were reported as being harvested, of which Canada Goose (*Branta canadensis*) and Snow Goose (*Anser caerulescens*) made up 66% (260 individuals). Bird species reported as being harvested by Rankin Inlet HHS participants in 2021 included Canada Goose (134 individuals), Common Eider (3), Greater White-fronted Goose (*Anser albifrons*; 6), gulls (*Larus* sp.; 40), Northern Pintail (*Anas acuta*; 10), ptarmigan (*Lagopus* sp.; 58), Sandhill Crane (10), Snow Goose (126), and Tundra Swan (*Cygnus columbianus*; 7). Most birds were harvested in marine shoreline areas and lakes near Rankin Inlet (Figure 6.9) during the spring and fall migrations (Figure 6.10).

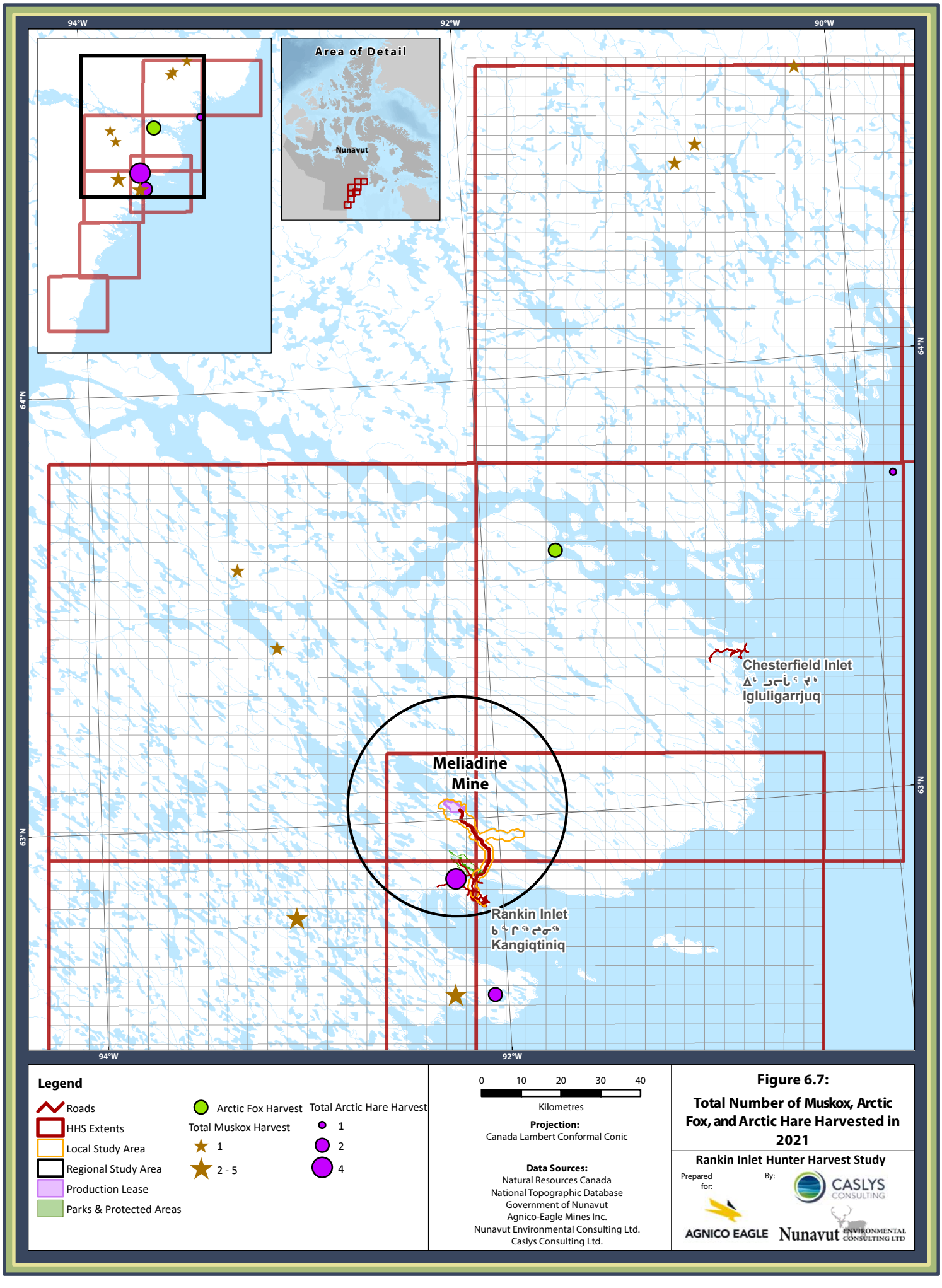
6.4 MARINE MAMMAL SPECIES

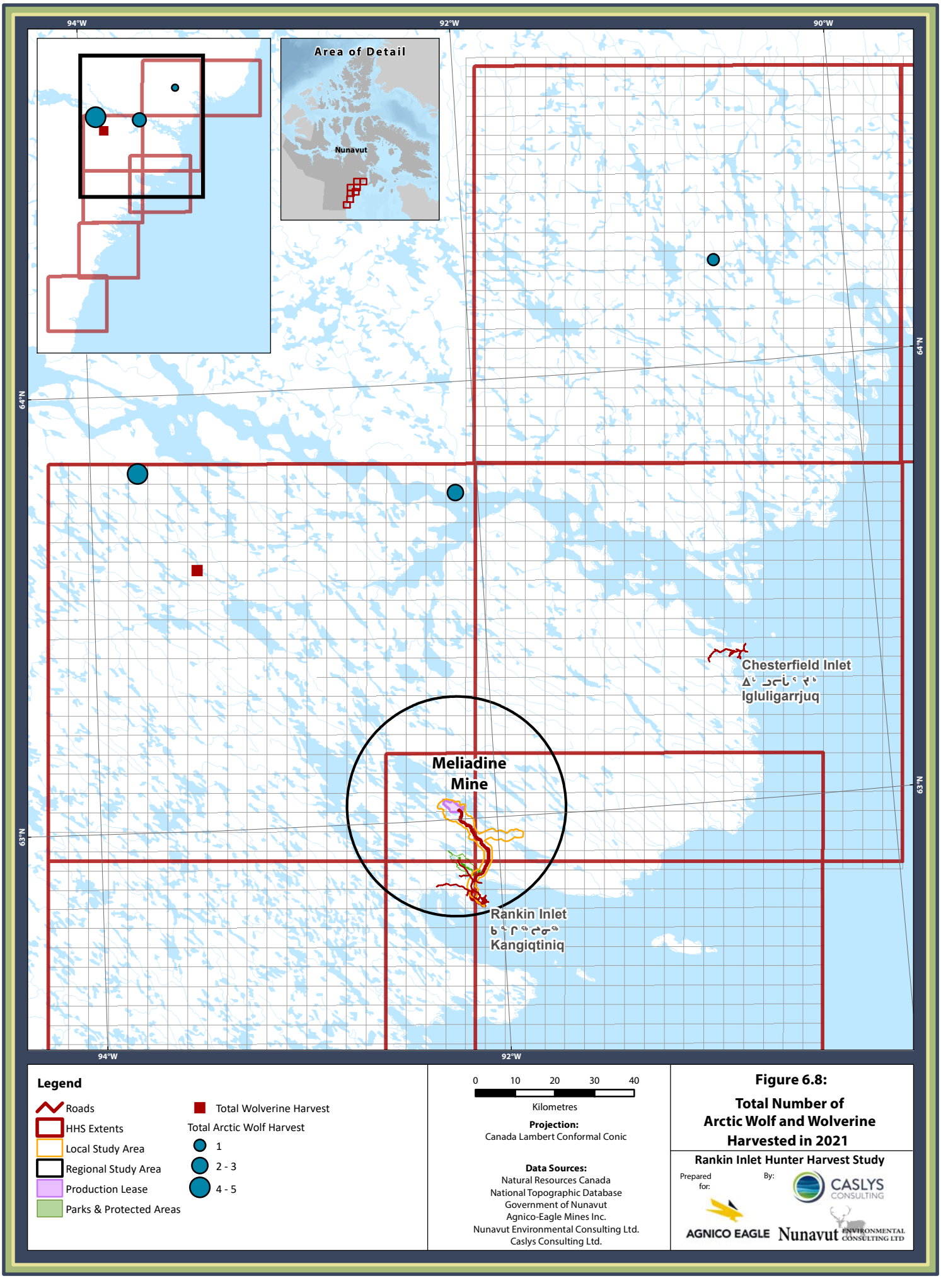
6.4.1 Seals

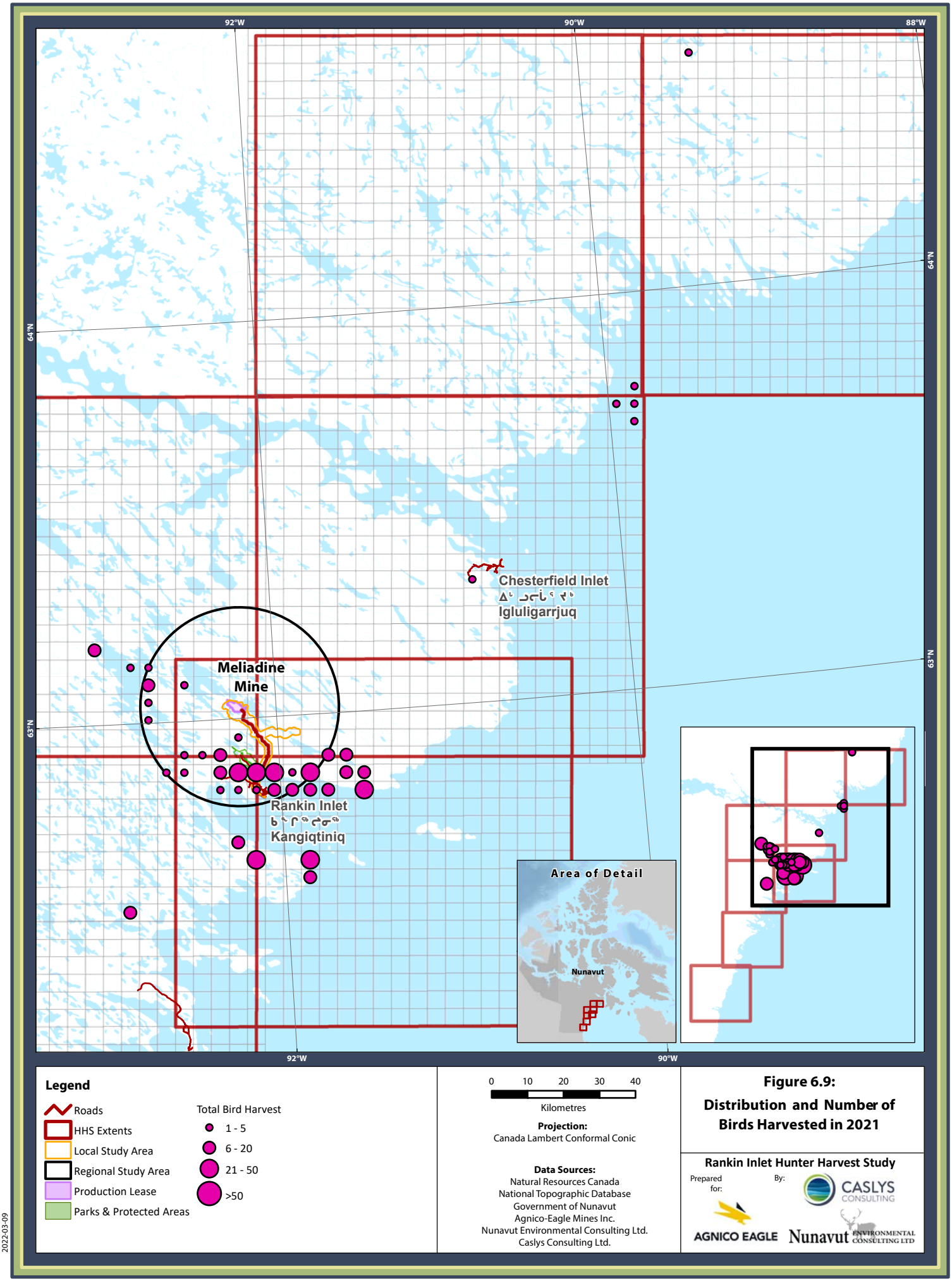
Ringed Seal (*Pusa hispida*) and Bearded Seal (*Erignathus barbatus*) were the only seals reported as harvested by HHS participants, with Ringed Seal the most harvested (i.e., 25 individuals vs 5 Bearded Seal). Seal harvests generally occurred near shoreline areas south and east of Rankin Inlet (Figure 6.11). Bearded Seal was considered by one hunter to be particularly delicious if prepared properly.

6.4.2 Beluga and Walrus

Other marine mammal species harvested included Beluga (11 individuals) and Walrus (*Odobenus rosmarus*; 3). Belugas were harvested around Marble Island and near the mainland shoreline north of the island (Figure 6.11). Walrus were harvested near Marble Island.


94°W
92°W
90°W
64°N
63°N
Area of Detail
Nunavut
Chesterfield Inlet
ᐃᓚᒋᑦᑕᐃᒃ
Igluligarrjuq
Meliadine
Mine
Rankin Inlet
ᑲᖏᖅᑕᓂᖅ
Kangiqtiniq
Legend
Roads
HHS Extents
Local Study Area
Regional Study Area
Production Lease
Parks & Protected Areas
Arctic Fox Harvest
Total Muskox Harvest
1
2 - 5
Total Arctic Hare Harvest
1
2
4
0
10
20
30
40
Kilometres
Projection:
Canada Lambert Conformal Conic
Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.
Figure 6.7:
Total Number of Muskox, Arctic Fox, and Arctic Hare Harvested in 2021
Rankin Inlet Hunter Harvest Study
Prepared for:
By:
CASLYS CONSULTING
AGNICO EAGLE
Nunavut ENVIRONMENTAL CONSULTING LTD
2022-03-09


94°W
92°W
90°W
64°N
63°N
Area of Detail
Nunavut
Chesterfield Inlet
ᐃᓚᒋᑦᑕᐃᓯᖅ
Igluligarrjuq
Meliadine
Mine
Rankin Inlet
ᑲᙵᖅᑕᓂᖅ
Kangiqtiniq
Legend
Roads
HHS Extents
Local Study Area
Regional Study Area
Production Lease
Parks & Protected Areas
Total Wolverine Harvest
Total Arctic Wolf Harvest
1
2 - 3
4 - 5
0 10 20 30 40
Kilometres
Projection:
Canada Lambert Conformal Conic
Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.
Figure 6.8:
Total Number of Arctic Wolf and Wolverine Harvested in 2021
Rankin Inlet Hunter Harvest Study
Prepared for:
By:
CASLYS CONSULTING
AGNICO EAGLE
Nunavut ENVIRONMENTAL CONSULTING LTD
2022-03-09


92°W
90°W
88°W
64°N
63°N
Chesterfield Inlet
ᐃᒡ ᓯᓚᐃᓪᓕᖅ
Igluligarrjuq
Meliadine
Mine
Rankin Inlet
ᑲᙵᒡᓕᓂᖅ
Kangiqtiniq
Area of Detail
Nunavut
Legend
Roads
HHS Extents
Local Study Area
Regional Study Area
Production Lease
Parks & Protected Areas
Total Bird Harvest
1 - 5
6 - 20
21 - 50
>50
0 10 20 30 40
Kilometres
Projection:
Canada Lambert Conformal Conic
Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.
Figure 6.9:
Distribution and Number of Birds Harvested in 2021
Rankin Inlet Hunter Harvest Study
Prepared for:
By:
CASLYS CONSULTING
AGNICO EAGLE
Nunavut ENVIRONMENTAL CONSULTING LTD
2022-03-09

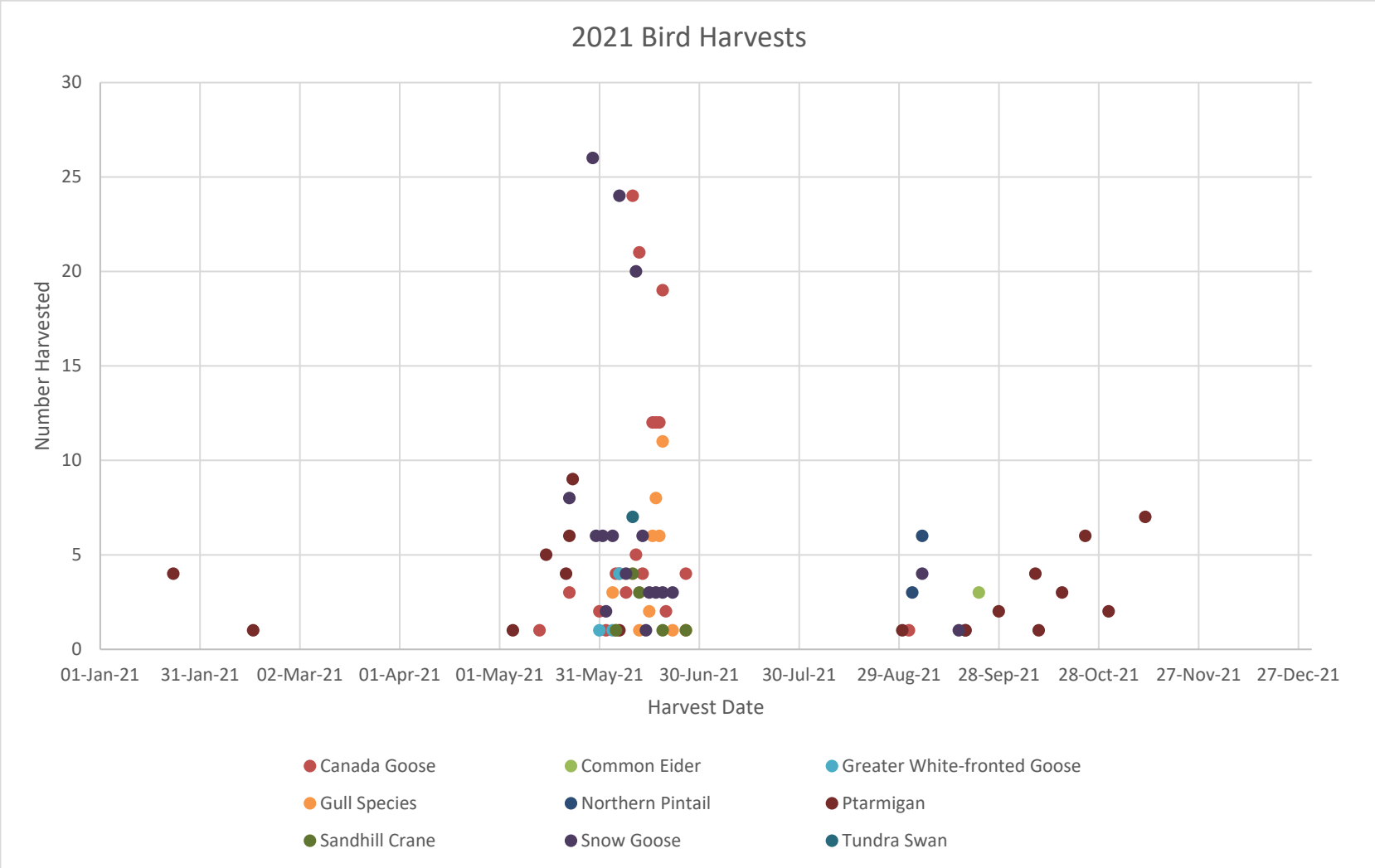
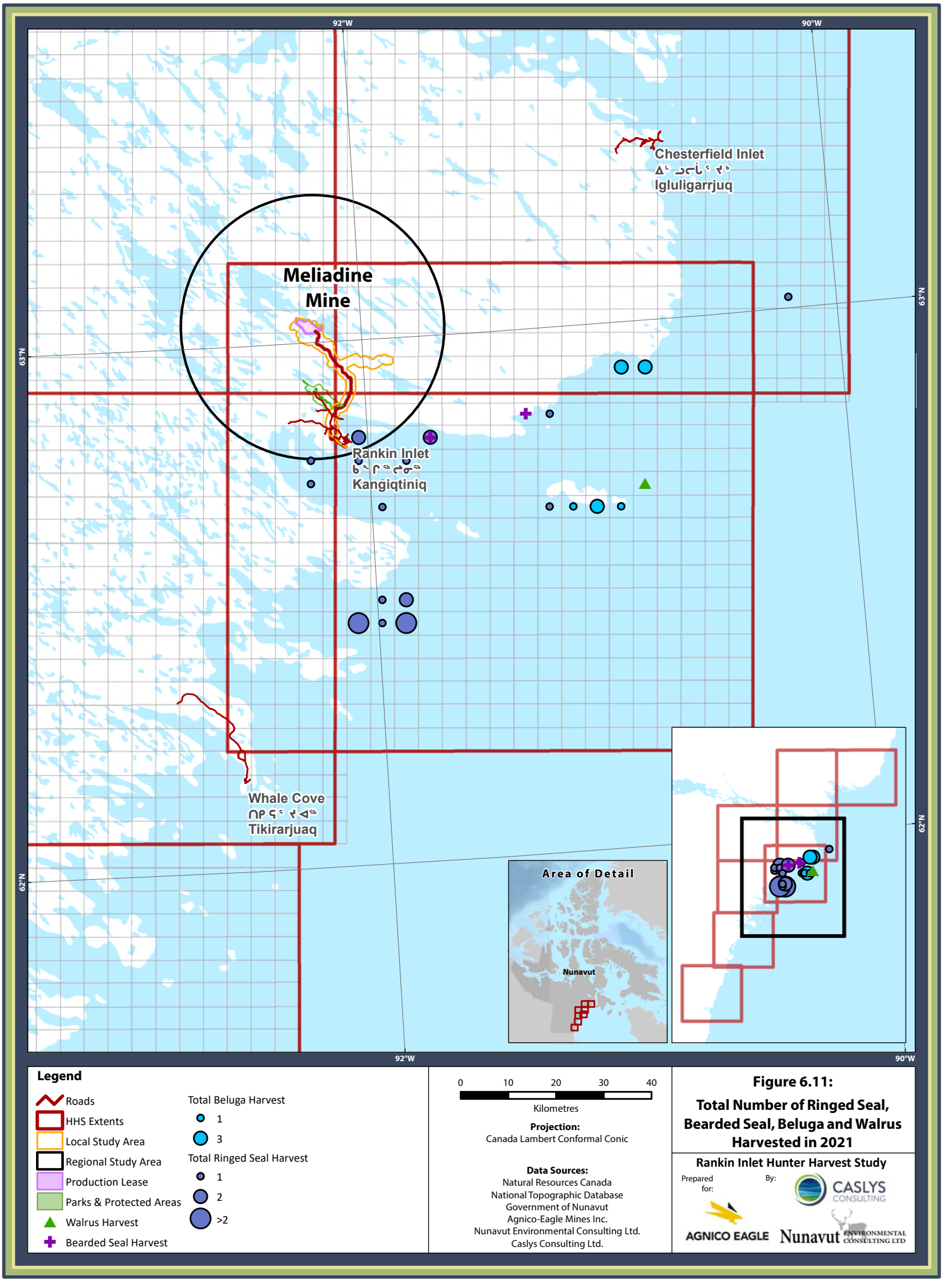


Figure 6.10: Season Distribution and Number of Birds Harvested in 2021.


92°W
90°W
63°N
63°N
62°N
62°N
Chesterfield Inlet
ᐃᒡ ᓯᕙᓂᖅ ᐊᒃ
Igluligarrjuq
Meliadine
Mine
Rankin Inlet
ᑲᙵᒋᑦᑎᙵᖅ
Kangiqtiniq
Whale Cove
ᑎᑭᕋᖅ ᓴᐊᖅ
Tikirarjuaq
Area of Detail
Nunavut
Legend
Roads
HHS Extents
Local Study Area
Regional Study Area
Production Lease
Parks & Protected Areas
Walrus Harvest
Bearded Seal Harvest
Total Beluga Harvest
1
3
Total Ringed Seal Harvest
1
2
>2
0
10
20
30
40
Kilometres
Projection:
Canada Lambert Conformal Conic
Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.
Figure 6.11:
Total Number of Ringed Seal, Bearded Seal, Beluga and Walrus Harvested in 2021
Rankin Inlet Hunter Harvest Study
Prepared for:
By:
CASLYS CONSULTING
AGNICO EAGLE
Nunavut ENVIRONMENTAL CONSULTING LTD
2022-03-09

SECTION 7 • CREEL SURVEY RESULTS

7.1 NUMBER OF FISHERMEN

The number of fishermen reporting successful fishing trips in 2021 was 24. The highest numbers of fisherman reporting success in 2021 were in the May and June period (see Table 7.1) (see Section 7.4 Magnitude of Fishing).

Table 7.1: Number of Fisherman in Rankin Inlet who Recorded Fishing Success by Year and Month.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0	0	0	4	19	10	6	4	3	2	3	1
Total	**0**	**0**	**0**	**4**	**19**	**10**	**6**	**4**	**3**	**2**	**3**	**1**

7.2 COMPOSITION OF CATCH

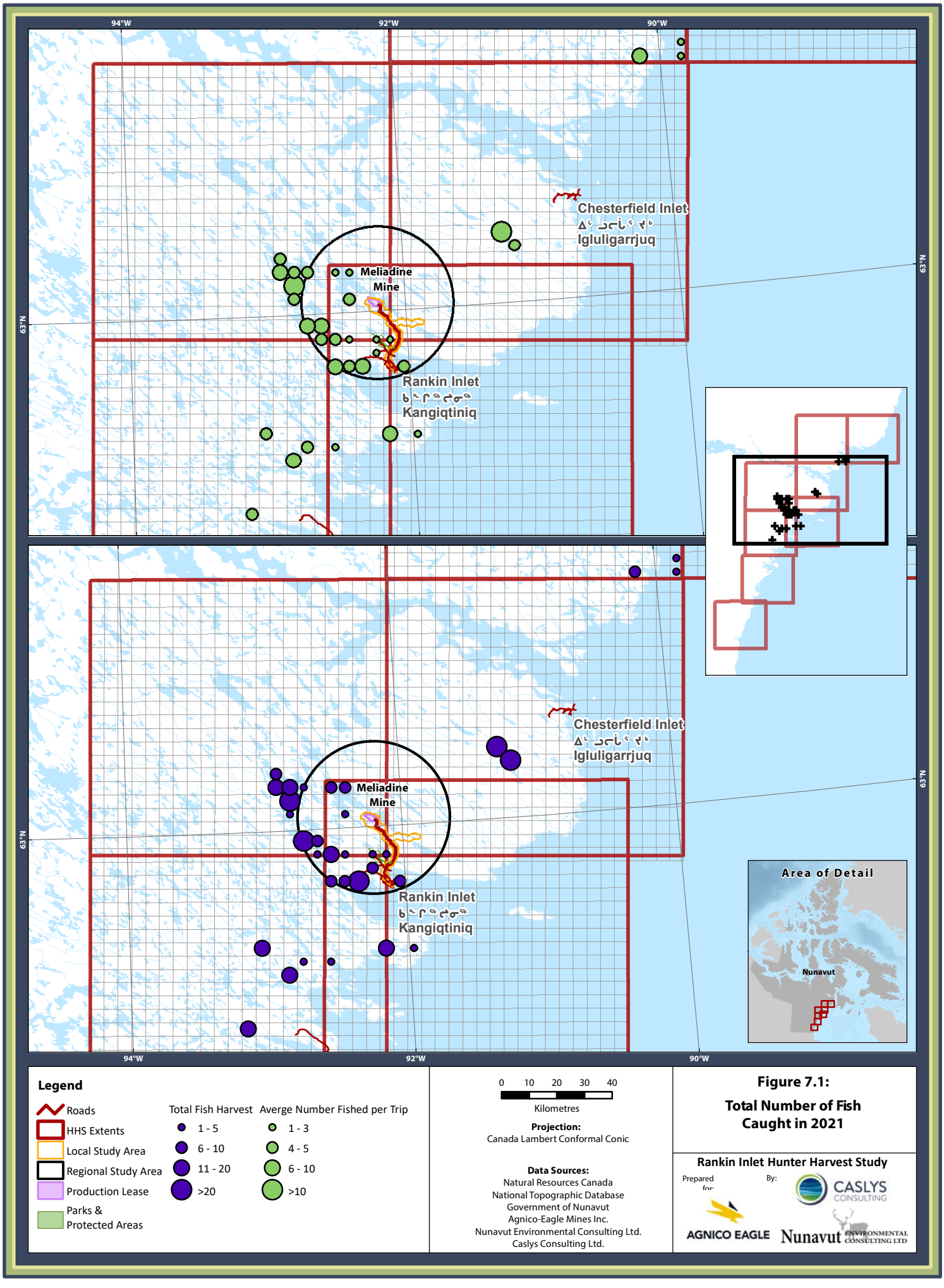
The most common fish species captured, Arctic Char, represented 72% of the total catch in 2021 (Table 7.2). Lake Trout (25%) were also captured at reasonably high numbers. The other two species that were the focus of the HHS, Arctic Grayling and Lake Whitefish, were caught at very low numbers. Other species caught, also at low numbers, included Arctic Cod (*Arctogadus glacialis*) and Burbot (*Lota lota*).

Table 7.2: Total Number of Fish Caught in 2021.

Species	2021	Total
Arctic Char	628	628
Arctic Cod	12	12
Arctic Grayling	7	7
Burbot	2	2
Lake Trout	216	216
Lake Whitefish	3	3
Totals	**868**	**868**

7.3 DISTRIBUTION OF FISHING

Fishing trips, regardless of success rate, generally occurred close to Rankin Inlet and, to a lesser extent, Chesterfield Inlet (see Figure 7.1). Some fishing occurred northeast of the Hamlet of Chesterfield Inlet (Figure 7.1). Results indicate that study participants rarely fished close to the Meliadine AWAR.



Legend

- Roads
- HHS Extents
- Local Study Area
- Regional Study Area
- Production Lease
- Parks & Protected Areas

Total Fish Harvest	Averge Number Fished per Trip
1 - 5	1 - 3
6 - 10	4 - 5
11 - 20	6 - 10
>20	>10

0 10 20 30 40
Kilometres

Projection:
Canada Lambert Conformal Conic

Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Nunavut Environmental Consulting Ltd.
Caslys Consulting Ltd.

Figure 7.1:
Total Number of Fish Caught in 2021

Rankin Inlet Hunter Harvest Study

Prepared for: AGNICO EAGLE

By: CASLYS CONSULTING; Nunavut Environmental Consulting Ltd.

2022-03-09

7.4 MAGNITUDE OF FISHING

The total number of fish harvested per fisherman in each month was highest in May and July with lower numbers in April, June, August, and November (Figure 7.2). In 2021, the most captured fish species, in order of abundance, were Arctic Char, Lake Trout and Arctic Char, and Arctic Cod (see Table 7.2).

7.5 SEASONAL TIMING OF FISHING

In 2021, fishing periods with the most active fisherman was from May to June (see Table 7.1) while the greatest number of fish caught was from May to July (Figure 7.2).

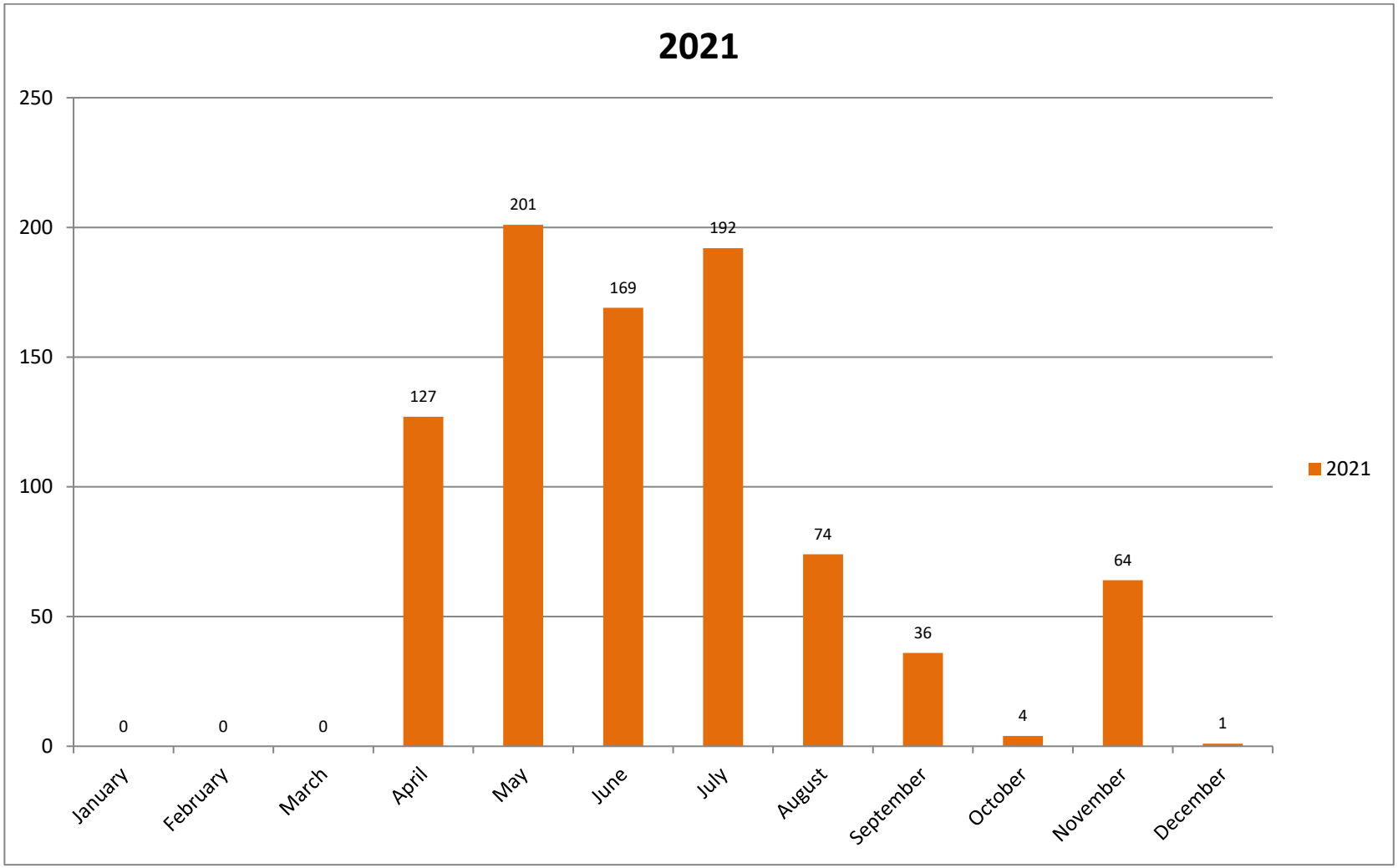


Figure 7.2: Total Number of Fish Caught by Month in 2021.

SECTION 8 • ACCURACY OF IMPACT PREDICTIONS

The TEMMP indicates that threshold levels for Caribou harvest will be set after three full years of data from the HHS. As 2021 was the first year with a relatively comprehensive data set, HHS results from 2022 and 2023 will be required before threshold levels are set.

SECTION 9 • MANAGEMENT RECOMMENDATIONS

The Rankin Inlet Hunter Harvest Study and Creel Survey should be continued on an annual basis to monitor the hunting and fishing patterns of Rankin Inlet residents, and the potential effects of the mine and AWAR. Meetings with participants in 2022 will be particularly important in maintaining contact, building relationships, expanding the study, and collecting good harvest data.

Furthermore, ongoing collaboration with the KHTO will ensure that the HHS program runs smoothly, incorporates local IQ and community concerns, and increases participant rates.

Participation rates can be maintained by continuing to use social media platforms such as Facebook and Instagram, expanding connections on these platforms, ensuring that all participants are visited during the three scheduled field visits, and continuing with distribution of the well-received year-end prizes while in the community. An effort should be made to bringing on new participants in 2022.

APPENDIX A

2021 Rankin Inlet Hunter Harvest Calendar

2021

Rankin Inlet Harvest Study

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Muskox Bull

Lars Qaqqaq

January | ᑕᖅᑭᓇᖅᓯᐊᕐᖓ 2021

Rankin Inlet Harvest Study
ᑲᖏᖅᑕᓂᕐᒥᑦ ᓴᖅᐃᑕᐅᔪᓂᒃ ᖃᐅᐅᔨᓴᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᓚᓂᓴᖅ	Tuesday ᑐᖅᓯᐊᖅᓇᖅ ᓯᕗᓕᖅ	Wednesday ᐱᖏᓚᓯᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
					1 New Year's Day	**2**
3	**4**	**5**	**6**	**7**	**8**	**9**
10	**11**	**12**	**13**	**14**	**15**	**16**
17	**18**	**19**	**20**	**21**	**22**	**23**
24	**25**	**26**	**27**	**28**	**29**	**30**
31						

December 2020

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February 2021

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

Winter Sun

Lars Qaqqaq

February | ᐊᕐᓂᓕᕆᑲ 2021

Rankin Inlet Harvest Study
ᑲᖏᖅᑕᓂᖅᑎᑦ ᒪᖅᐃᑕᐅᔨᓂᒃ ᖃᐅᔨᓴᐃᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᓚᓂᓴᖅ	Tuesday ᑐᖅᓯᐊᖅᓇᖅ ᓯᕗᓕᖅ	Wednesday ᐱᖏᓴᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
	1	2 Groundhog Day	3	4	5	6
7	8	9	10	11	12	13
14 Valentine's Day	15 Family Day	16	17 Ash Wednesday	18	19	20
21	22	23	24	25	26	27
28						

January 2021

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

March 2021

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Long-distance Hunting

Winston Ookowt

March | ᓇᓯᑎᐊᓯ 2021

Rankin Inlet Harvest Study
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Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᓴᓕᖅ	Tuesday ᑐᖅᓯᐊᖅᓇᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖏᓴᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
	1	2	3	4	5	6
7	8	9	10	11	12	13
14 Daylight Savings Time Starts	15	16	17 St. Patrick's Day	18	19	20
21 First Day of Spring	22	23	24	25	26	27 Passover
28 Palm Sunday	29	30	31			

February 2021

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

April 2021

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Baker Lake Fishing

Dylan White

April | ᑎᓇᓵᐃᓪ 2021

Rankin Inlet Harvest Study
ᑲᖏᖅᓯᓂᖅᑎᑦ ᒪᖅᐃᑕᐅᔪᓂᒃ ᖃᐅᔨᓴᐃᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᒪᓂᓴᖅ	Tuesday ᑐᐳᔪᖅᓇᖅ ᔪᑲᓕᖅ	Wednesday ᐱᖓᓱᐊᓪ	Thursday ᔪᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
March 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	May 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31			1	2 **Good Friday**	3
4 **Easter Sunday**	5 **Easter Monday**	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22 **Earth Day**	23	24
25	26	27	28	29	30	

Peregrine Falcon

Martin Gebauer

May | ᓄᕐᓂᐃᑦ 2021

Rankin Inlet Harvest Study
ᑲᖏᖅᓯᓂᖅᑎᑦ ᒪᖅᐃᑕᐅᔨᓂᒃ ᖃᐅᔨᓴᐃᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᓚᓂᓴᖅ	Tuesday ᑐᑭᓯᐊᖅᓇᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖓᓱᐊᕐᑕ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
						1
2	3	4	5	6	7	8
9 Mother's Day	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24 Victoria Day	25	26	27	28	29
30	31					

April 2021

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

June 2021

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Willow Ptarmigan

Martin Gebauer

June | ᒪᐃᓂᑦ 2021

Rankin Inlet Harvest Study
ᑲᖏᕐᓂᓕᕆᑎᑦ ᒪᑦᑲᐃᑕᐅᔪᓂᖅ ᖃᑲᐅᓴᐃᓚᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᓕᐅᔪᓴᖅ	Tuesday ᑐᐱᓯᐊᖅᓇᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖏᓴᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20 Father's Day	21 National Aboriginal Day First Day of Summer	22	23	24	25	26
27	28	29	30			

May 2021

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

July 2021

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Arctic Wolf

Dylan White

July | ᐊᖏᑕᑦ 2021

Rankin Inlet Harvest Study
ᑲᖏᕆᓕᓂᖅᑎᑦ ᒪᖁᐃᑕᐅᔨᓂᒃ ᖁᐅᓴᐊᐃᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᒪᓂᖁᖅ	Tuesday ᑐᑭᓯᐊᖅᓇᖅ ᓯᓚᓕᖅ	Wednesday ᐱᖏᓴᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖁᐃᑐᖅᓇᖅ
June 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	August 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31			1 **Canada Day**	2	3
4	5	6	7	8	9 **Nunavut Day**	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Caribou Harvest

Lars Qaqqaq

August | ᐊᑯᓕᓕᑭᕆᔨᖅ 2021

Rankin Inlet Harvest Study
ᑲᖏᕐᓂᓂᕐᒥᑦ ᒪᑦᑲᐃᑕᐅᔪᓂᖅ ᖃᑲᕗᓴᐃᓂᕐᖓ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᓕᐅᔪᓂᓴᖅ	Tuesday ᑐᑭᓯᐊᖅᓇᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖏᓴᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
1	2 Civic Holiday	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

July 2021

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September 2021

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

Sik Sik

Dylan White

September | ᐊᒥᖏᐃᔨᖏᓐᓄᑦ 2021

Rankin Inlet Harvest Study
ᑲᖏᕐᓂᔪᓂᖏᑦ ᒪᖏᐃᑕᐅᔨᓂᒃ ᖁᐅᐳᓴᐃᓂᖅᖢᑦ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᒪᓂᖅᖢᑦ	Tuesday ᑐᒃᓱᐊᖏᓇᖅ ᓱᖃᓕᖅᖢᑦ	Wednesday ᐱᖓᓱᐊᐊᑦ	Thursday ᓱᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᕆᐃᑐᖏᓇᖅᖢᑦ
			1	2	3	4
5	6 Labour Day	7	8	9	10	11
12	13	14	15	16	17	18
19 Terry Fox Run	20	21	22 First Day of Autumn	23	24	25
26	27	28	29	30		

August 2021

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

October 2021

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Ptarmigan

Dylan White

October | ᐅᑭᐅᓪᓕ 2021

Rankin Inlet Harvest Study
ᑲᖏᖅᓯᓂᖅᑎᑦ ᒪᖅᐃᑕᐅᔨᓂᒃ ᖃᐅᔨᓴᐃᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᓚᓂᖅᓴᖅ	Tuesday ᑐᒃᓯᐊᖅᓇᖅ ᓯᕗᓕᖅ	Wednesday ᐱᖏᓴᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
					1	2
3	4	5	6	7	8	9
10	11 Thanksgiving	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31 Halloween						

September 2021

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

November 2021

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Drying Meat

Martin Gebauer

November | ᑲᑕᒍᓗᕐᕒᖅ 2021

Rankin Inlet Harvest Study
ᑲᖏᖅᓯᓂᖅᑎᑦ ᓴᖅᐃᑕᐅᔪᓂᖅ ᖃᐅᔨᓴᐃᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᓕᐅᔪᓂᓴᖅ	Tuesday ᑐᑭᓯᐊᖅᓇᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖏᓴᐋᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓇᖅ
	1	2	3	4	5	6
7 Daylight Savings Time Ends	8	9	10	11 Remembrance Day	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

October 2021

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

December 2021

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Common Raven

Martin Gebauer

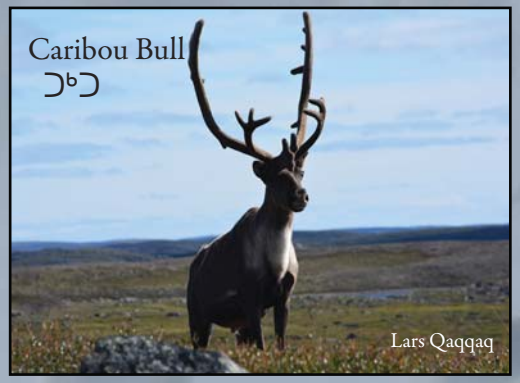
December | ᐊᖏᔪᓕᖅ 2021

Rankin Inlet Harvest Study
ᑲᖏᕐᓂᔅᓯᒋᐊᕐᓂᖅ ᓴᖅᐃᑕᐅᔪᓂᖅ ᖃᐅᔨᓴᐃᓂᖅ

Sunday ᓴᓇᑕᐃᓕ	Monday ᓴᓇᑕᐃᓕᐅᓴᐃᖅ	Tuesday ᑐᖅᓯᐊᖅᓯᖅ ᓯᑲᓕᖅ	Wednesday ᐱᖓᓱᔪᐊᑦ	Thursday ᓯᑕᒪᑦ	Friday ᑕᓕᒪᑦ	Saturday ᓂᖅᐃᑐᖅᓯᖅ
November 2021 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	January 2022 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21 First Day of Winter	22	23	24	25 Christmas Day
26 Boxing Day	27	28	29	30	31 New Year's Eve	

Please return the calendar to the Agnico-Eagle office for entry into the participant draw.

Wildlife and Fish Species of Interest



Martin Gebauer

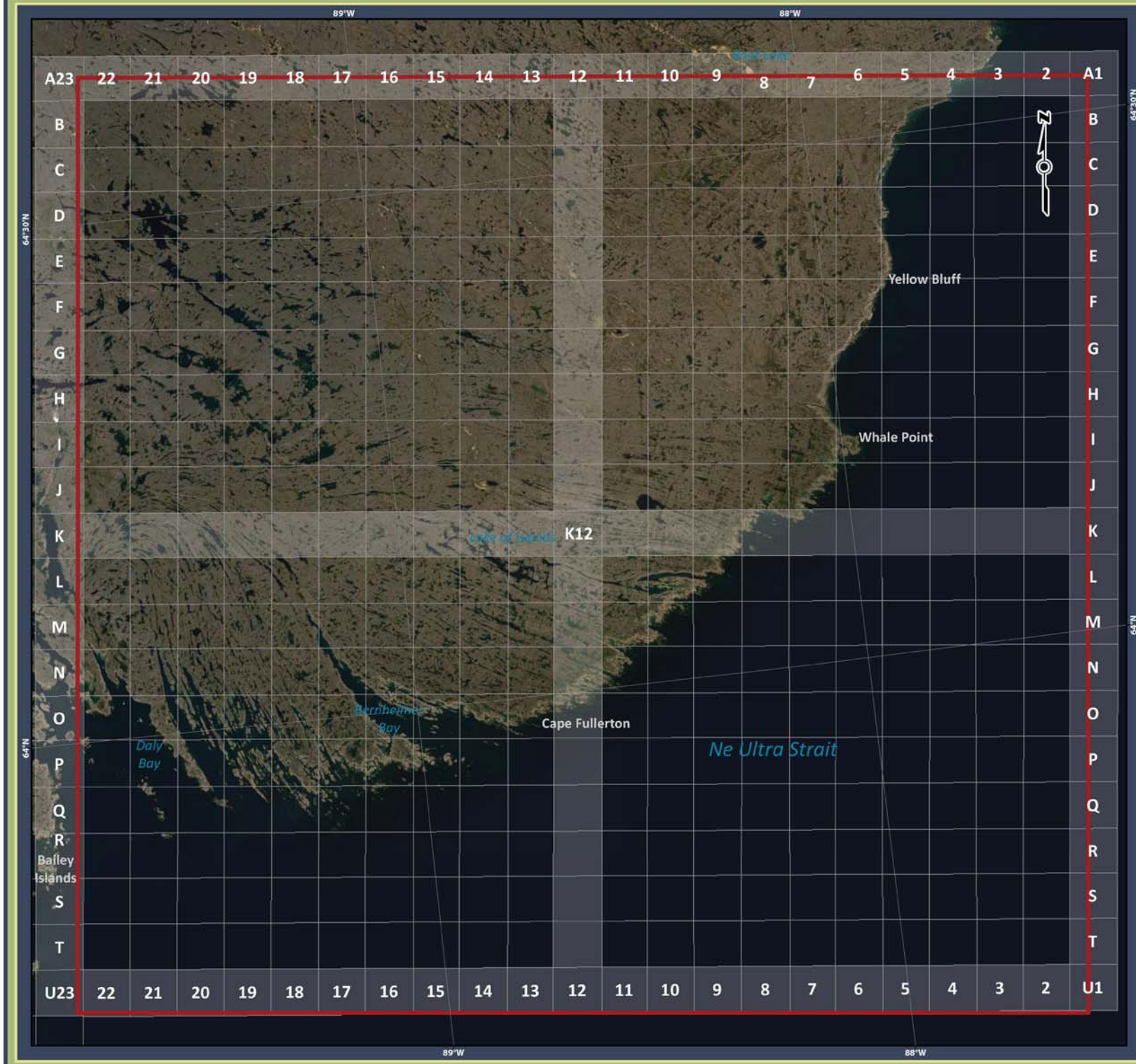
Wildlife and Fish Species of Interest

Martin Gebauer

31/05/2021

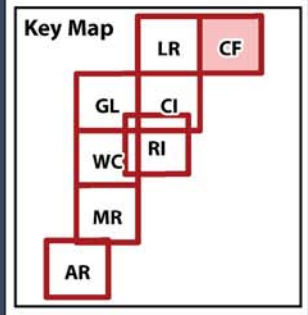
KEY MAP
98°W
96°W
94°W
92°W
90°W
88°W
64°30'N
63°45'N
63°N
62°15'N
61°30'N
60°45'N
60°N
Baker Lake
ᑲᒪᓂᑐᖅ
Qamanittuaq
Lorillard River
Cape Fullerton
Harry Gibbons Migratory Bird Sanctuary
Chesterfield Inlet
ᐃᒡᓗᖏᑦᑐᖅ
Igluligarrjuq
Gibson Lake
Chesterfield Inlet
Meliadine Mine
Iqalugaarjuup Nunanga Territorial Park
Rankin Inlet
ᖃᙵᕐᓂᖅ
Kangiq&iniq
Rankin Inlet
Whale Cove
Whale Cove
ᑎᑭᕐᔪᐊᖅ
Tikirarjuaq
Maguse River
Arviat
ᐊᕕᐊᑦ
McConnell River Migratory Bird Sanctuary
Arviat
0 10 20 30 40
Kilometres
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

28/05/2021



Rankin Inlet Harvest Study

Cape Fullerton



0 5 10 15

Kilometres

Projection: Canada Lambert Conformal Conic

Data Sources:
Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:

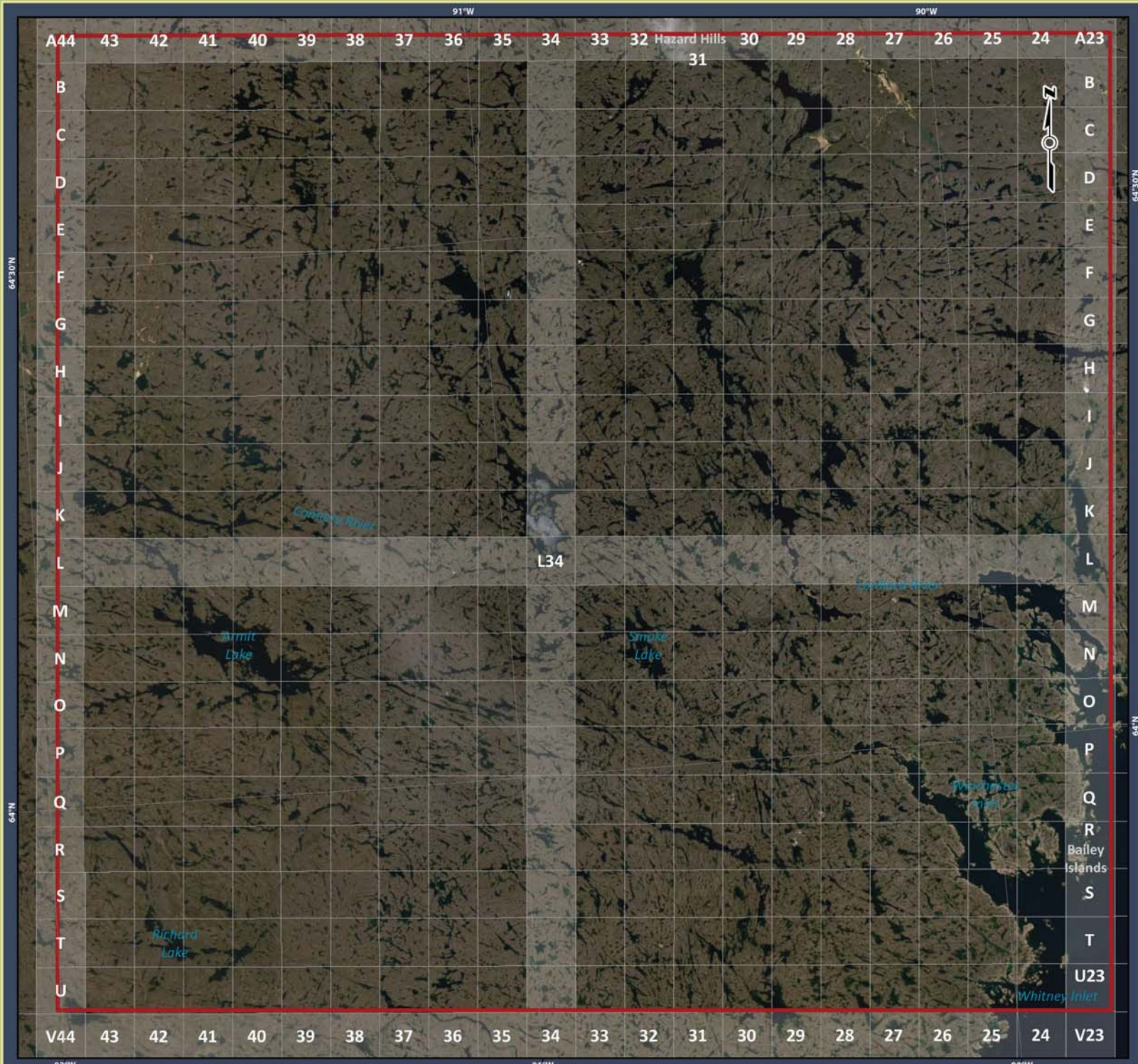
AGNICO-EAGLE

By:

Nunavut Environmental Consulting Ltd

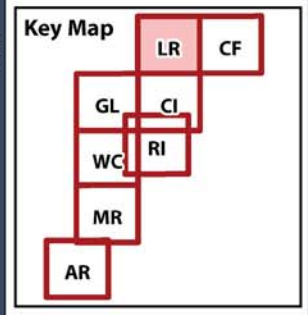
CASLYS CONSULTING

28/05/2021



Rankin Inlet Harvest Study

Lorillard River



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Kilometres

Projection: Canada Lambert Conformal Conic

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Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:

AGNICO-EAGLE

By:

Nunavut Environmental Consulting Ltd

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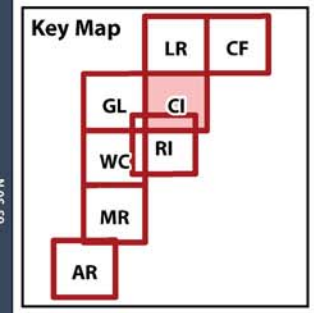
Rankin Inlet Harvest Study

Chesterfield Inlet



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Kilometres

Projection: Canada Lambert Conformal Conic

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National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
Caslys Consulting Ltd.

Prepared for:

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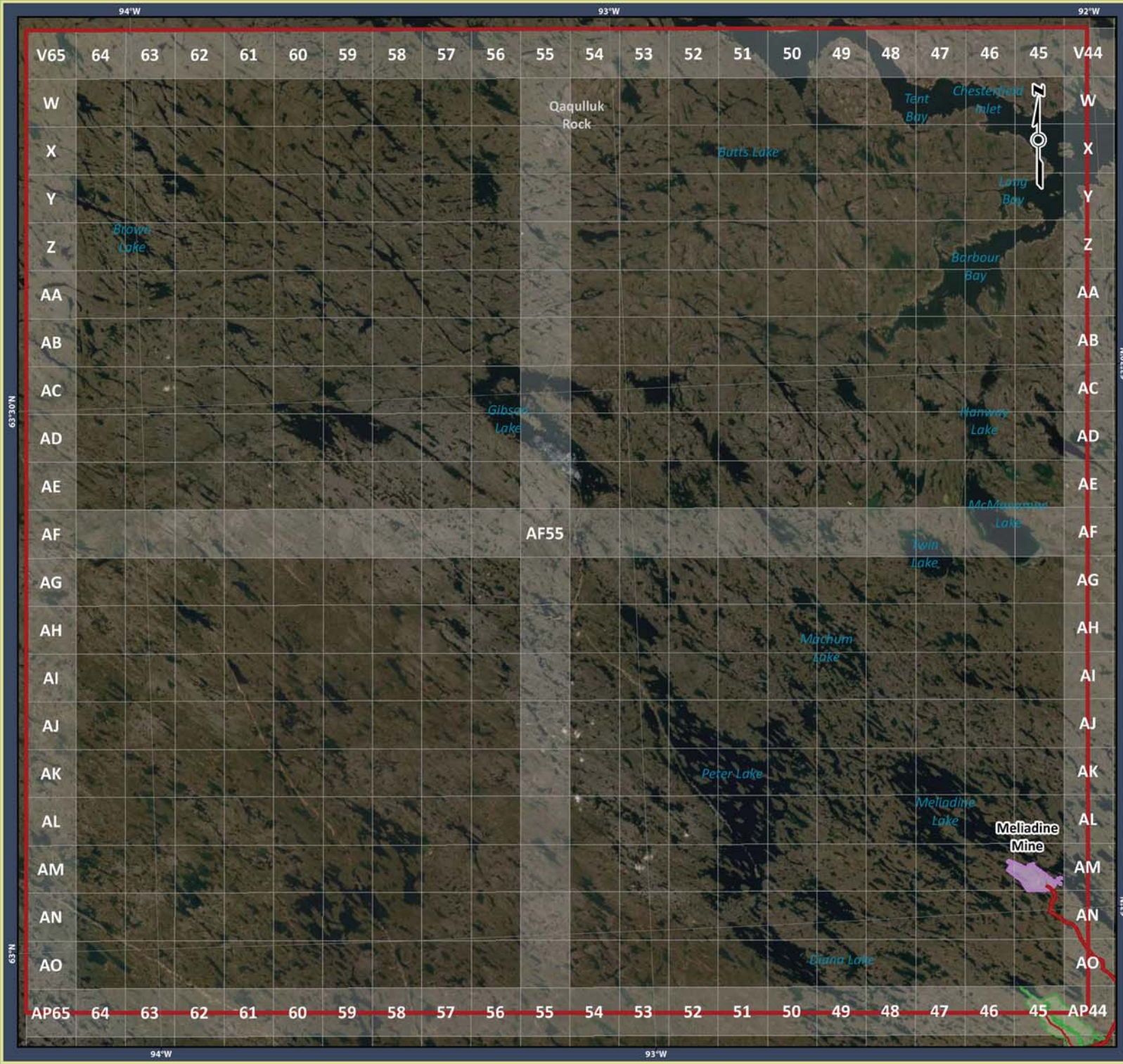
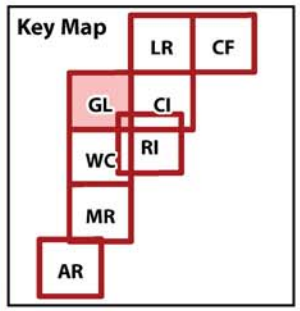
Rankin Inlet Harvest Study

Gibson Lake





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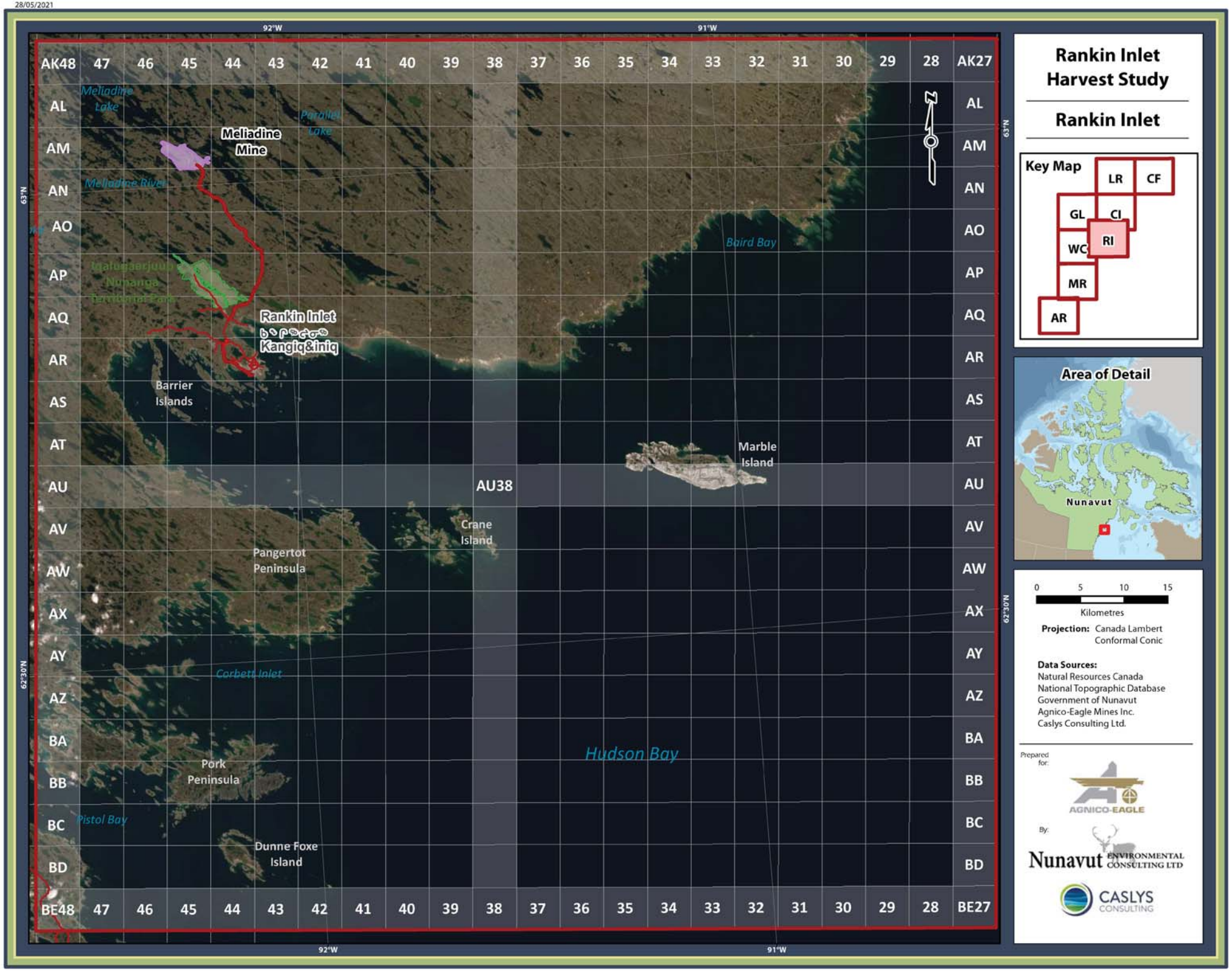
28/05/2021



Rankin Inlet Harvest Study

Rankin Inlet

0 5 10 15

Kilometres

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Natural Resources Canada
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Inc.
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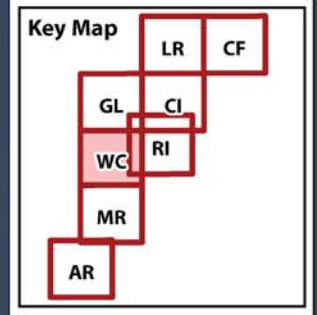
Rankin Inlet Harvest Study

Whale Cove



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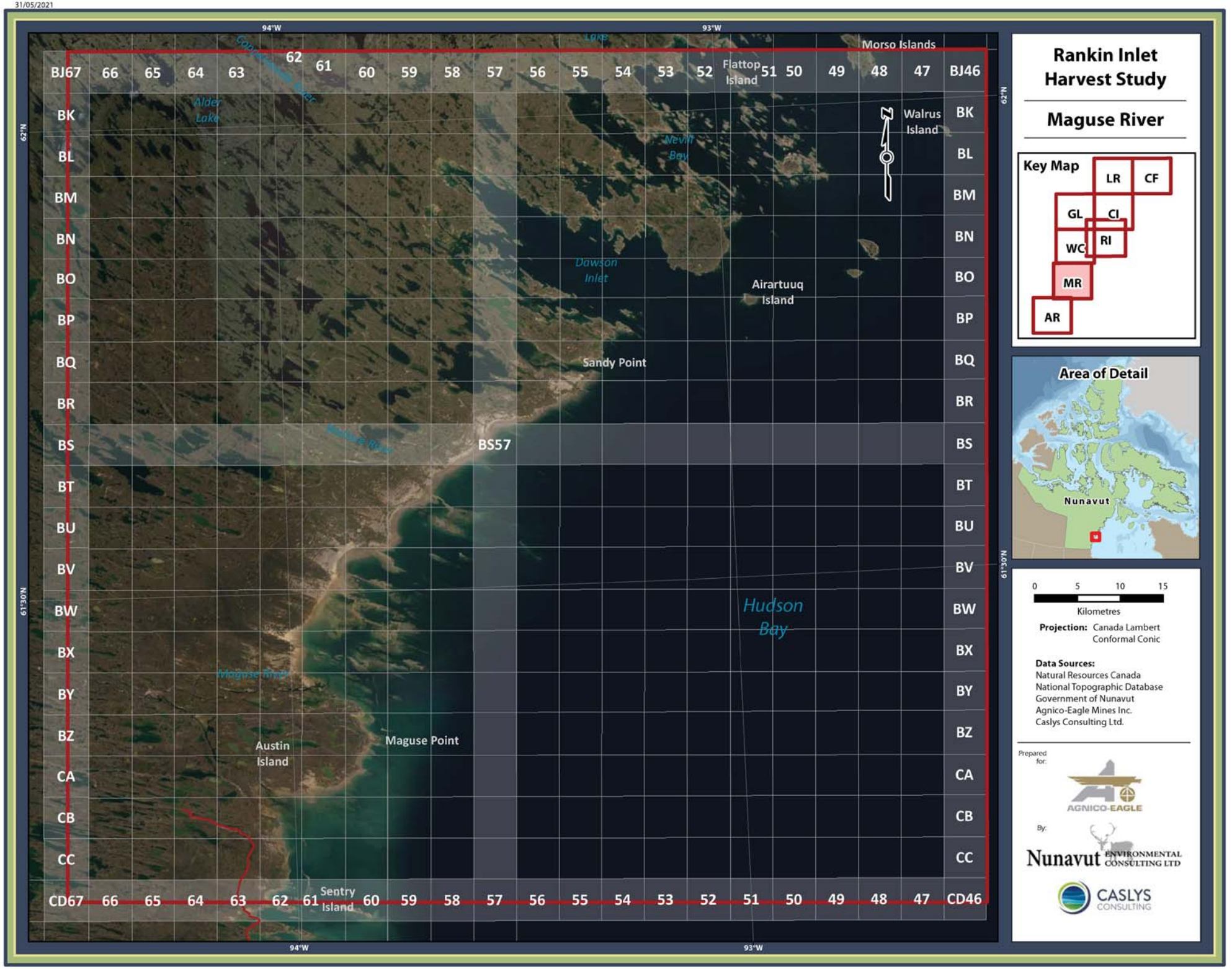

Rankin Inlet Harvest Study

Maguse River

0 5 10 15

Kilometres

Projection: Canada Lambert Conformal Conic

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Natural Resources Canada
National Topographic Database
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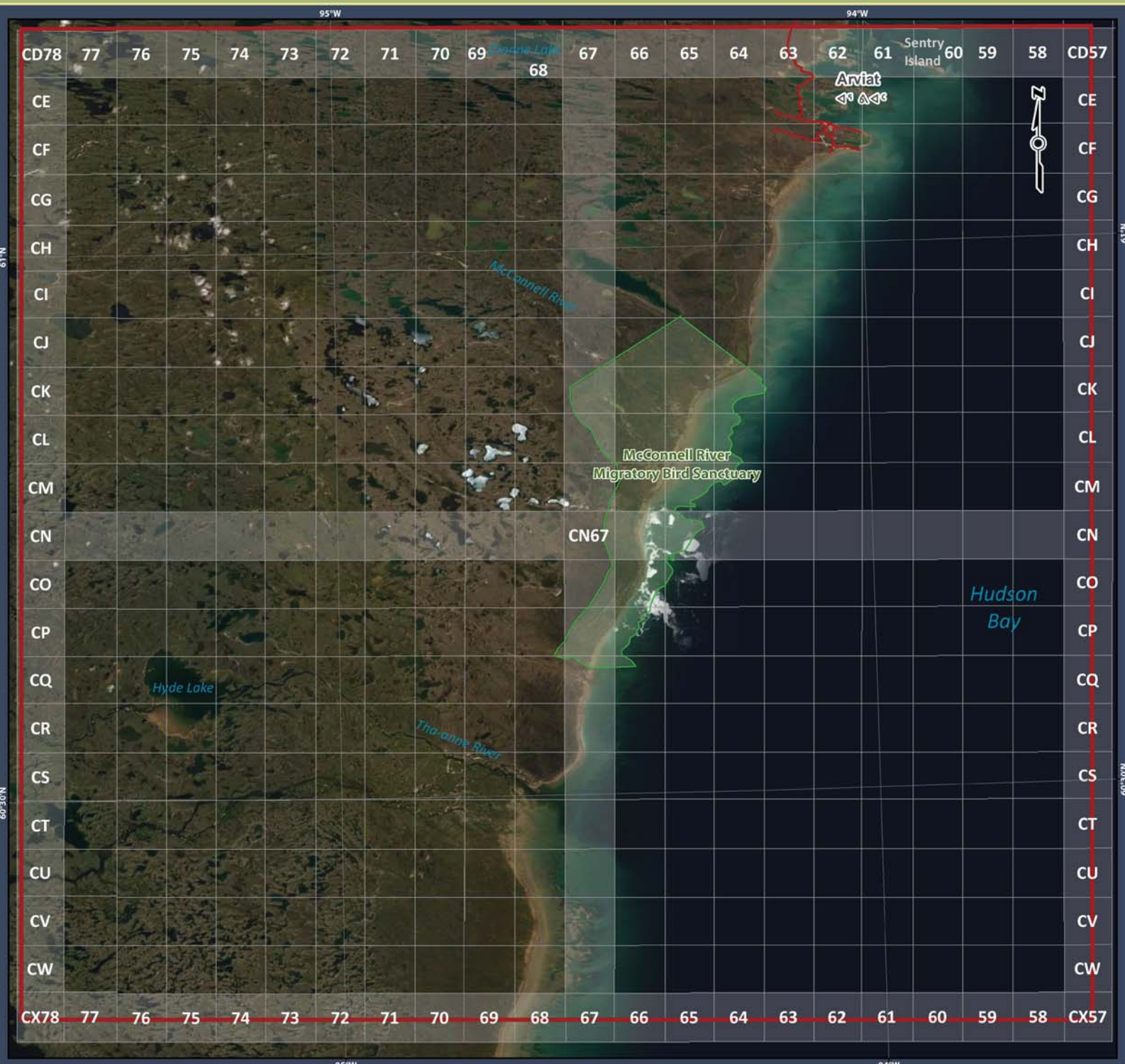
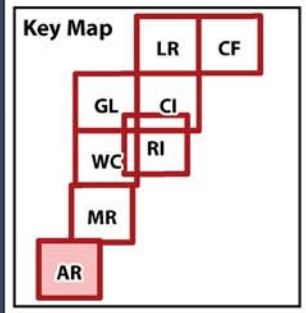
31/05/2021



Rankin Inlet Harvest Study

Arviat



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Caslys Consulting Ltd.

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AGNICO-EAGLE

By:

Nunavut Environmental Consulting Ltd

CASLYS CONSULTING

How to Use the Rankin Inlet Harvest Calendar

Agnico Eagle Mines Ltd. (Agnico), in cooperation with the Kangiqlinq Hunters and Trappers Organization (KHTO) of Rankin Inlet, want to understand hunting and fishing patterns by Rankin Inlet residents. Specifically, we want to understand how the Meliadine Project and the all-weather access road (AWAR), located north of Rankin Inlet, might influence traditional harvesting patterns. To ensure that traditional hunting and fishing activities are not negatively affected, we have developed this calendar where participants can record harvest information throughout the year.

Near the back of the calendar is a page that shows the animal and fish species that are included in the study. Please write down the species, number, sex, and location of animals or fish that you have harvested on each date on the calendar. When writing down the location, please use the XY coordinate system provided on the maps at the back of the calendar.

You will also be visited or contacted by the hunter harvest consultant or a KHTO member occasionally throughout the year. The consultant's or member's job will be much easier if you write down your harvest information in the calendar as soon as possible.

Please return the calendar to the Agnico or KHTO offices in Rankin Inlet at the end of the year or give the calendar to the consultant on the January 2022 visit.

Each participant will receive a gift (e.g., gas voucher) expressing our thanks, and additional prizes will be provided in January 2022 at the end of the study.

If you have any questions, please contact the Rankin Inlet Harvest Study Consultant, Dylan White at 1-266-500-4202 or dsgwhite@gmail.com. You can also contact a KHTO member in the community or email Martin Gebauer at martin@gebauerassociates.com.

ᖃᓄᖅ ᐊᑐᕆᐊᖃᖅᖢᓂᖏᑦ ᑲᖏᖅᓯᓂᖅᑎᑦ ᒪᖃᐃᑎᓄᓪᓗᒃ ᐅᐸᑐᖅᓴᐅᑎ

ᐊᓚᓂᓄᖅ ᐅᓴᕋᖅᑕᕆᐊᑦ ᓕᒥᑎᑦ (ᐊᓚᓂᓄᖅᓄᑦ),ᐱᓕᕆᖃᑎᑎᕐᓗᑎᑦ ᑲᖏᖅᓯᓂᖅᑎᑦ ᐅᒪᔨᓕᕆᔨᒋᓄᖅᑦ,ᑐᑭᓯᐊᓕᕐᒪᒪᔨᑦ ᑲᖏᖅᓯᓂᖅᑎᐅᑕᓄᑦ ᐊᑐᖅᑕᐅᖃᖅᑎᑦᑕᖅᑐᓂᖅ ᒪᖃᐃᐅᓂᓪᓗᑦ ᐊᓚᓗᓪ ᐃᖃᖅᓕᐊᖃᓂᓪᓗᑦ. ᐱᓗᐊᖅᑐᒥᑦ, ᑐᑭᓯᐊᓕᕐᒪᒪᔭᖅᑦ ᑕᓯᔨᐊᖅᑎᑦ ᐱᓕᕆᖃᑎᖅ ᐊᓚᓗᓪ ᐅᑭᐅᖓᓂᖅ ᐊᓪᓚᖅᑐᑦ, ᐅᐊᖏᓇᖓᓂᑦ ᑲᖏᖅᓯᓂᖅᑎᐅᓪ, ᐱᓪᔨᑎᖃᑐᖅᑐᒃᓯᒪᔪᓂᓪᓗᑦ ᐱᖅᑯᓯᔪᖅᑦ ᒪᖃᐃᐅᓂᓪᓗᑦ ᐊᑐᖅᑕᐅᖃᖅᑎᑦᑕᖅᑐᓂᖅ. ᐱᖅᑯᓯᔪᖅᑦ ᒪᖃᐃᐅᓂᖅ ᐊᓚᓗᓪ ᐃᖃᖅᓕᐊᖃᓂᖅ ᐱᐅᖏᓪᑐᑐᖅᑯᓯᓂᓪᓗᑦ, ᐊᖅᑭᐅᔪᓕᐅᖅᑐᒍᑦ ᐅᓪᓗᖅᓯᔪᐅᑎᒃ ᐃᓕᐅᖅᑕᐅᔨᓄᑦ ᑎᑎᕋᖏᓂᕐᒧᐊᓗ ᐅᑭᐅᖃᓂᓪᓗᑦ ᑐᑭᓯᔪᐅᑎᒥ

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